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DEPARTMENT OF MINES AND RESOURCES
Hon. T. A. Crerar, Minister; Charles Camsell, Deputy Minister

NATIONAL MUSEUM OF CANADA

BULLETIN No. 87

Anthropological Series No. 22

PHYSICAL ANTHROPOLOGY OF THE ROEBUCK IROQUOIS

With Comparative Data from other Indian Tribes

BY

Sir Francis H. S. Knowles

OTTAWA
J. O. PATENAUDE, I.S.O.
PRINTER TO THE KING'S MOST EXCELLENT MAJESTY
1937

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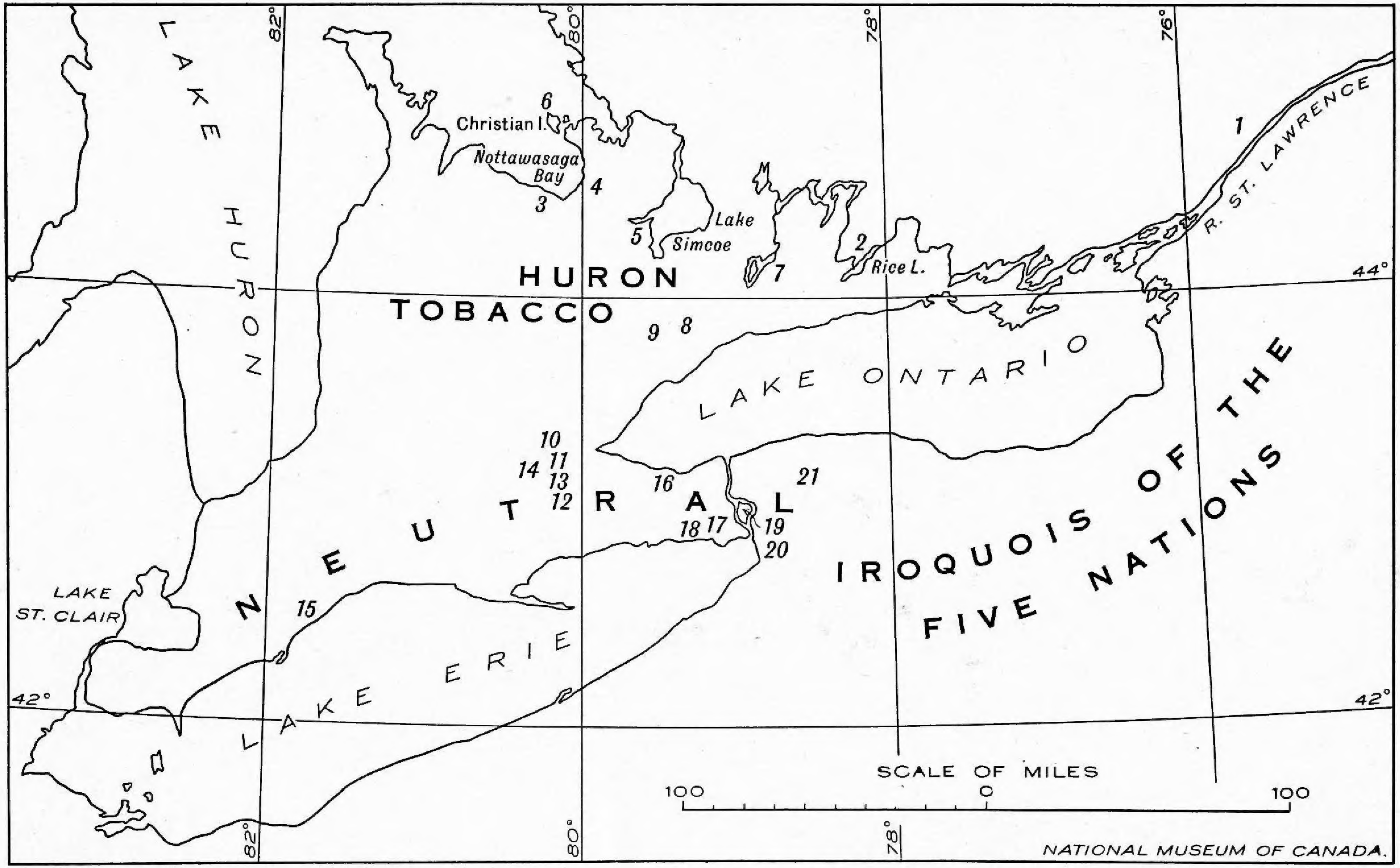

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Figure 1. Sketch map outlining the locations of the Huron, Tobacco, and Neutral nations of Ontario, and of the Iroquois of New York state, at the commencement of the Seventeenth century. The numbers indicate the village sites, ossuaries, and graves mentioned in the report. 1, Village site at Roebuck, Augusta tp., Grenville co.; 2, Mounds in Peterborough co.; 3, Ossuary in Nottawasaga tp., Simcoe co.; 4, Ossuary on lot 72, con. II, Flos tp., Simcoe co.; 5, Ossuary on lot 25, con. XII, Innisfil tp., Simcoe co.; 6, Ossuary at Fort Ste. Marie, Christian island; 7, Ossuary on west half of lot 3, con. XI, Manvers tp., Durham co.; 8, Cssuary on lot 6, con. IV, Markham tp., York co.; 9, Ossuary on lot 12, con. III, Vaughan tp., York co.; 10, Ossuary in Beverly tp., Wentworth co.; 11, Cssuary No. 3, near Jerseyville, Beverly tp., Wentworth co.; 12, Ossuary at Middleport, lot 60, con. III, Onondaga tp., Brant co.; 13, Village site on the Walker farm, lot 10, con. II, Onondaga tp., Brant co.; 14, Village site on the Sealey farm, lot 9, first range south of Hamilton road, Brantford, Onondaga tp., Brant co.; 15, Village site at Clearville, Orford tp., Kent co.; 16, Ossuary on lot 5, con. VI, Clinton tp., Lincoln co.; 17, Ossuary near Sherks, Humberstone tp., Welland co.; 18, Port Colborne, Welland co.; 19, Graves on Grand island; 20, Post-European cemetery, Buffalo, N.Y.; 21, Ossuary near Orangeport, N.Y.

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PREFACE

On the sketch map facing this page are indicated very roughly the territories of the Huron, Tobacco, and Neutral nations, and of the Iroquois of New York state, at the commencement of the Seventeenth century.

The *Hurons* were a confederation of Iroquoian tribes occupying a territory around lake Simcoe and south and east of Georgian bay. By the French they were called "Hurons". Their own name for their confederation was "Wendat" (meaning, possibly, "the islanders", or, "dwellers on a peninsula"). Later the combined fugitives of the Huron and Tobacco nations were known as Wyandots—a corruption of the original Huron name "Wendat".

The *Tobacco nation* lived in the hilly country south of Nottawasaga bay, in Grey and Simcoe counties. Their name for themselves was "Tionontati" ("there the mountain stands"—Hewitt). By the French they were called the "Nation du Petun", on account of their large fields of tobacco.

The *Neutrals* were a confederation of Iroquoian tribes occupying a territory north of lake Erie and having four villages east of Niagara river, their country, therefore, extending from Genesee river on the east to a boundary indefinitely west of Detroit river and lake St. Clair. By the Hurons they were called "Attiwandaronk", meaning "they are those whose language is awry". By the French they were called the "Nation Neutre" for the reason given by Champlain: "Il y a aussi à deux iournées d'iceux vne autre nation de Sauuages, qui font grand nombre de Petun, d'vn costé tirant au Su, lesquels s'appellent la nation neutre, qui sont au nombre de quatre mil hommes de guerre, qui habitent vers l'Occident du lac des Entouhonorons de quatre-vingt à cent lieuës d'estenduë, lesquels neantmoins assistent les cheueux releuez contre les gens de feu : Mais entre les Yroquois, et les nostres, ils ont paix, et demeurent comme neutres:"[1]

The *Iroquois* of the state of New York were composed at this date of five tribes—the Seneca, Cayuga, Onondaga, Oneida, and Mohawk. They occupied a territory extending from the east watershed of lake Champlain to the west watershed of Genesee river, and from the Adirondacks southwards to the territory of the Conestoga. The name "Iroquois" is derived from the Algonkian: Irin akhoiw, "real adders", with the French suffix -ois.

Between 1648 and 1651 the Iroquois of the Five Nations attacked first the Hurons, next the Tobacco nation, and lastly the Neutrals. Each in turn they broke up. Of the Ontario-Iroquoian nations many were killed, a large number were taken prisoner and adopted into the tribes of their conquerors, and the remainder were forced as fugitives to abandon their former territories.

For full information, with references to literature, about the foregoing peoples, *See* "The Handbook of American Indians north of Mexico", Smithsonian Institution, Bureau of American Ethnology, Bulletin 30.

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[1] The Works of Samuel De Champlain, under the general editorship of H. P. Biggar, The Champlain Society, Toronto, 1929, vol. III, pp. 99-100.

ACKNOWLEDGMENTS

Thanks are due to Mr. Harlan I. Smith and Mr. W. J. Wintemberg for information relative to the archæology of the Roebuck village site, which was explored for the Geological Survey, Canada, in 1912 and 1915 by Mr. Wintemberg, under the direction of Mr. Smith.[1] Mr. Wintemberg also supplied information on the archæology and ages of various Iroquoian sites in Ontario, which has been of the greatest assistance in the grouping of comparative data.

The late Mr. F. W. Waugh supplied a number of references to Iroquoian literature that have proved of assistance, and also information on Iroquoian food and cookery.

The kindness and courtesy of the late Dr. R. B. Orr of the Provincial Museum, Toronto;[2] of Dr. C. T. Currelly, Curator of the Royal Ontario Museum of Archæology, Toronto; and of Mr. Henry R. Howland, of the Buffalo Society of Natural Sciences, are gratefully acknowledged. With their permission measurements were taken from skeletal material for comparative purposes. To Mr. W. L. Bryant of the Buffalo Society of Natural Sciences the writer is indebted for archæological information and for much personal kindness during his stay in Buffalo. Thanks are also extended to Professor Henry Montgomery, Ph.D., for his courtesy in connexion with the skeletal material collected by him from mounds in Manitoba and Ontario, now in the collection of the Royal Ontario Museum of Archæology, Toronto.

Acknowledgments are also due to Dr. L. H. Dudley Buxton, Reader in Physical Anthropology, Oxford University, for his kindness in checking the mathematical work upon which the calculations accompanying this paper are based; and for his very valuable criticism and suggestions with regard to several questions that were raised in the course of this work—suggestions that in the case of stature as estimated from the length of the long bones led to further inquiries into the discrepancy between the results obtained from the tibia and those from the femur and humerus.

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[1] Wintemberg, W. J.: "Roebuck Prehistoric Village Site, Grenville County, Ontario"; National Museum of Canada, Bull. No. 83.

[2] Since this report was written the Provincial Museum has been absorbed into the Royal Ontario Museum of Archæology, Toronto.

PHYSICAL ANTHROPOLOGY OF THE ROEBUCK IROQUOIS

CHAPTER I

DESCRIPTION OF THE ROEBUCK VILLAGE SITE

At Roebuck in Augusta township, Grenville county, Ontario, about 8 miles north of the St. Lawrence river, there are the remains of a prehistoric Indian village, one of the largest of several similar sites in the same county.

Its inhabitants were a people of Iroquoian culture, closely related, in the opinion of the excavator, Mr. W. J. Wintemberg, to the Mohawk and Onondaga nations. The village was situated upon a sandy ridge, surrounded on three sides by low, swampy ground through which ran a small creek. In the course of excavation it was found that the site had originally been surrounded by a palisade of posts. In the area enclosed by the palisade were large deposits consisting of ashes and general refuse thrown out from the lodges: a few deposits were also found along the steep edge of the bank outside the palisade. Altogether as many as twenty-five deposits were found; in some places they were as much as 4 feet deep. In them were found scattered and broken human bones, some showing marks of burning, a few, marks of cutting by sharp instruments. The articular ends of the long bones, in most cases, were in a defective condition; some seem to have been broken or hacked off, others are partly destroyed and show marks that might have been made by gnawing. The condyles of the various mandibles found scattered throughout the heaps have almost invariably been broken or hacked off. A number of broken cranial fragments were also found.

Several artifacts recovered from these refuse deposits were made of human bone. There were two awls made from human ulnæ, one of them from a large, strong bone; there were also two whole gorgets, and fragments of eight others, made of human skull. One of the two whole gorgets is of thick, solid bone, probably taken from the skull of a man; the other is thin, and the condition of the sutures makes it probable that it is from the skull of a child.

Eighty-four human skeletons were exhumed from graves on this site. There were three double and two triple burials. As far as the excavations went, the graves were found scattered throughout the whole site, some within the palisade, others outside. About half of the skeletons were under the refuse heaps in the sand, one was buried right in the ashes. In very few cases were any artifacts found in the graves.

CHAPTER II

GENERAL SURVEY OF THE HUMAN SKELETAL REMAINS

The skeletal remains from this village site fall into two categories—skeletons taken from the graves, and scattered human bones from the refuse deposits. There is a very marked difference between the two sets of bones. Those from the graves are light and fragile, in appearance and weight very similar to bones taken from ossuaries and graves in sandy soil in other parts of Ontario. The bones in a few of the graves were in a very poor state of preservation, only a few broken and crumbling fragments being still left. The scattered bones from the refuse heaps, in contrast, are remarkably heavy, hard, and fresh looking. The skeletal remains from the graves are undoubtedly remains of the people who inhabited this site; equally certainly must the bones in the refuse deposits have been deposited there during the occupation of the village; therefore, the difference between the two sets of bones cannot be explained by difference in their respective ages. It is a noteworthy fact that bone implements and tools, and, indeed, animal bones in general, found in this and other Ontario village refuse deposits, are hard, heavy, and fresh as compared with the human bones found in graves in the vicinity. Possibly the ashes of the refuse deposits have had some preservative effect upon the bones found in them.

Mr. R. A. A. Johnston[1] has suggested that animal bones now found in such deposits were probably boiled before being thrown out, and that the process of boiling, by expelling the fats from the bones, would arrest, or at any rate greatly retard, the process of disintegration when the bones or implements made from the cooked bones were later thrown out or lost in the rubbish deposits of the village. As the human bones in the refuse deposits agree in appearance and state of preservation with the animal bones and bone tools surrounding them, it seems probable that they have received similar treatment and been exposed to similar conditions. Taking into consideration these various circumstances, there seems to be a possibility that these are the bones of captives who were sacrificed by the inhabitants of the Roebuck village. Among the ancient Iroquoian peoples prisoners of war met with the following treatment. Women and children were usually adopted into the tribe of their captors. There are few references in the writings of the Jesuit missionaries to their being treated with the cruelty that was usually the lot of captured warriors. Indeed, Father Jerome Lalemant in a letter of 1641-42 specially mentions when describing the Neutral Nation that (as translated) " . . . they conduct themselves with almost the same cruelties as the Hurons do towards their enemies. However, they practice the further cruelty of burning the women prisoners-of-war, as well as the men—which is not done by the Hurons, who either give them their lives, or content themselves with knocking them down in the heat of the moment, and bearing off some portion of their bodies."[1] Warriors, on the other hand, were either adopted to take the place of relatives killed in war, or tortured to death at the stake, by fire.

---

[1] Formerly mineralogist of the Geological Survey, Canada.

An examination of the human bones from the refuse deposits shows that there are possibly as many as thirty-five individuals represented by these scattered and broken bones. Probably only two women and two children are represented; the rest appear to have been men who would seem to have been young or in the prime of life—as one would expect if they were warriors taken in battle.

In many cases the bones are large, rugged, and strong, being evidently those of powerful men. The tibiæ are in many cases extremely platycnemic. The articular ends of these scattered bones all show marks of gnawing, and many of them show the marks of cutting or hacking. The cutting might have been done in the process of disjointing. One would have expected that the gnawing would have been the work of the village dogs, yet if so it is curious that there are no teeth marks on the shafts of the bones. Two awls were found that had been made from human ulnas, and also several gorgets made from pieces of human skull. All these bone objects are heavy and fresh looking, being similar in this respect to other artifacts found that were made of animal bone.

The high percentage of decayed teeth from human jaws and fragments of jaws scattered among the refuse deposits leads to the conclusion that, if they came from captives, these captives were probably for the most part members of hostile Iroquoian tribes.[2]

A more detailed account of the examination of these bones is given before taking up the study of the skeletal remains from the graves.

---

[1] The Jesuit Relations and Allied Documents, edited by Reuben Gold Thwaites, Cleveland, 1897, vol. 21, p. 195.

[2] *See* page 5 for the comparison between the teeth of various Ontario groups.

CHAPTER III

SCATTERED HUMAN BONES FROM THE REFUSE DEPOSITS

The table below lists the various bones that were present in the refuse deposits. The writer has tried to estimate from them the number of individuals represented, their sex, and their ages.

Bone	Number of individuals represented	Adult male	Adult female	Adult, sex uncertain	Children
Frontal bones	23	11	1	10	1
Occipital bones	13	7	1[1]	3	2
Upper jaws	9			9	
Lower jaws	35[2]				1
Right humeri	9	2		7	
Left humeri	11	2	2	7	
Right radii	3	2		1	
Left radii	8	6	1	1	
Right ulnæ	10	2		8	
Left ulnæ	8	2	1	5	
Right femora	8	4	1	3	
Left femora	12	2	2	8	
Right tibiæ	14	5		9	
Left tibiæ	16	6		10	
Right fibulæ	8	1		7	
Left fibulæ	1			1	
Right clavicles	3			3	
Left clavicles					
Right patellæ	3			3	
Left patellæ	2			2	
Right scapulæ	6			6	
Left scapulæ	4			4	
Sacra	3	1	1		1
Right ossa innominata	5	4			1
Left ossa innominata					
Right temporal	7	4		2	1
Left temporal	7	7			

[1] Either female or non-adult.

[2] Almost all of these lower jaws are those of fairly young adults; a few are of men of middle age.

The main results of this examination may be summarized as follows:

The frontal and occipital bones and lower jaws are our best guide as to the number of individuals represented by these remains; in the case of the other bones there is often uncertainty as to whether a right and left bone are a pair or belong to different individuals. By the frontal bones we have probably about 23 individuals represented. Of these 11 are almost certainly adult males, 1 almost certainly an adult female, 1 a child; the remaining 10 are probably adult; but it is not possible to be certain as to their sex. Five "frontals" and three at least of the lower jaws are fragments only. There is, therefore, a possibility that two or more may be parts of the same bone. However, the writer has considered each as representing a distinct individual in order to obtain an idea as to the outside limit of the number of people represented by these remains.

By the occipital bones there are 13 individuals represented, 2 of whom are children, the rest adults.

By the lower jaws we have as many as 35 individuals represented, that is, supposing that each fragment and incomplete jaw represents a single individual. All but one belong to adults, the single exception being that of a child about twenty months old. So far as can be judged these jaws are mainly those of males. Many of the mandibles are marked by former inflammation and abcesses at the roots of certain of the teeth.

Surveying the other bones of the skeletons present there do not seem to be more than two females represented among any series of bones. The greatest number of individuals are represented by the left tibiæ and are 16 in number, all adults.

On the whole we may say that there are possibly as many as 35 individuals represented by these scattered and broken bones. It is absolutely certain that there are at least 18 (16 adults as shown by the tibiæ, and the 2 children evidenced by the occipital and other bones). Probably only 2 women and 2 children are here. The rest were men, of whom the majority were young.

TEETH

Many of the teeth associated with these remains from the refuse deposits had been affected by caries. The writer has tabulated the proportion below, and, for comparative purposes, the proportions in the remains, first from the graves at Roebuck, then from various ossuaries and graves elsewhere in Ontario.

—	Number of sound teeth	Number of teeth affected by caries	Percentage of teeth affected by caries
Refuse deposits at Roebuck—			
Permanent teeth from adult skulls—			
Upper jaw	31	4	....
Lower jaw	30	8	....
Miscellaneous	4	2	....
Total	65	14	17·7
Graves at Roebuck—			
(a) Permanent teeth from adult skulls	516	223	30·2
(b) " fully erupt teeth from adult and non-adult skulls	721	242	25·1
Huron and (?) Huron ossuaries[1]—			
(a) Permanent teeth from adult skulls	237	61	20·5
(b) " fully erupt teeth from adult and non-adult skulls	277	62	18·3
Middleport ossuary[2]—			
(a) Permanent teeth from adult skulls	216	76	26
(b) " " " non-adult skulls	13	1	....
(c) " " found loose in ossuary	458	152	24·9
Total number of permanent teeth	687	229	25
Temporary teeth	50	13	....
Iroquoian ossuaries in Neutral territory[3]—			
Permanent teeth in adult skulls	93	41	30·6
Mounds in Peterborough county, Ontario[4]—			
(a) Permanent teeth in adult skulls	230	3	1·29
(b) " fully erupt teeth in adult and non-adult skulls	236	3	1·26

---

[1] Five Huron or probably Huron ossuaries (*See* footnote 7, p. 15); four represented in the cranial collection of the Provincial Museum, Toronto, and one in the collection of Sir Daniel Wilson in the Royal Ontario Museum of Archæology, Toronto (*See* footnote 7, p. 14).

[2] An ossuary of pre-European age at Middleport, Brant county, Ontario (*See* p. 14).

[3] Seven ossuaries, some pre-European, some post-European, and some of doubtful age, in Wentworth, Welland, Lincoln, and Kent counties, represented in the collections of the Provincial Museum, Toronto; the Buffalo Society of National Sciences, Buffalo; and the National Museum of Canada, Ottawa (*See* p. 32 *et seq*).

[4] The "Serpent" mound, Otonabee tp., Peterborough county, excavated by Professor H. Montgomery, Ph.D.; mounds on the north shore and islands of Rice lake; and Preston mound, near Hastings in Asphodel township, Peterborough county, explored by Dr. David Boyle (*See* p. 15).

In the percentage of caries of the teeth, the Iroquoian groups on the whole agree very closely with each other. The Hurons, as compared with the other Iroquoian groups, show a smaller percentage, but in their case we have to take into consideration the fact that comparatively few of the teeth still remain in the crania examined, and it is probable that the teeth still remaining in the sockets would be the sounder ones. The greatest number of permanent teeth from any one ossuary in this group is 142, teeth from adult and non-adult crania included. This ossuary is that in Manvers township, Durham county. Out of these 142 teeth, there are 38 or 26·8 per cent affected by caries, a figure that agrees with those of the other Iroquoian groups. As a contrast to this there is the ossuary in Markham township, York county, material from which is in the collection of Sir Daniel Wilson in the Royal Ontario Museum of Archæology, Toronto; for in this case there are 40 permanent teeth from adult crania with only 3 of them showing caries. On the whole, however, the writer considers that the present figure for the percentage of caries in Huron teeth is lower than that to be found in a larger and more complete series.

All the Iroquoian groups form with regard to these percentages a sharp contrast to the tribes of the mounds. In these latter the amount of caries is almost negligible. The teeth from the Roebuck refuse deposits show a percentage of caries high as compared with the teeth from the mounds, but somewhat low as compared with Iroquoian teeth. However, in their case we have two factors to take into consideration, both of which might influence the percentage. First that the number of teeth found is small as compared with the number of jaws, and, second, that there would be more chance under the treatment these jaws had received of the sounder teeth surviving and being found when in later times the refuse deposits were explored.

LONG BONES

Most of the long bones recovered from the refuse deposits were too fragmentary to measure. Those that were whole had the following dimensions:

			Mm.
Humeri..........................	1 adult male	left humerus	332
Radii..........................	1 adult female	left radius	238
Ulnæ..........................	1 adult male	right ulna	270
	1 adult male	left ulna	281
Tibiæ..........................	1 adult male	left tibia	397
	2 adult probably male	right tibiæ	390 378

For comparison are given measurements of the long bones from the Middleport ossuary, mentioned on page 14, which is the best series of measurements of Iroquoian long bones the writer can supply. So far as can be judged from such small numbers the two series seem much alike in point of size.

Long Bones from Middleport Ossuary

		Mm.
Humeri	Mean measurement of 11 adult male left humeri	331·5
Radii	Mean measurement of 3 adult female left radii	246
	Minimum measurement	239
Ulnæ	Mean measurement of 4 adult male right ulnæ minimum 250 mm., maximum 286 mm.	273·5
	Mean measurement of 6 adult male left ulnæ minimum 253 mm., maximum 300 mm.	270·7
Tibiæ	Mean measurement of 11 adult male right tibiæ minimum 376 mm., maximum 428 mm.	394
	Mean measurement of 6 adult male left tibiæ minimum 353 mm., maximum 421 mm.	391·82

The tibiæ from the refuse deposits, all, or nearly all, bones of adult males, yielded the following platycnemic indices:

Platycnemic Indices

Index	Right tibiæ	Left tibiæ	Index	Right tibiæ	Left tibiæ
46	1	1	58	...	...
47	...	1	59	1	...
48	1	...	60	1	...
49	...	...	61	2	1
50	...	...	62	...	...
51	...	...	63	1	1
52	...	1	64	...	...
53	...	...	65	...	1
54	...	1	66	1	1
55	...	...	67	...	1
56	1	2			
57	...	1	Means	57·78 (9 cases)	57·5 (12 cases)

The platycnemic indices of other Iroquoian tibiæ are appended for comparison.[1]

—	Male			Female		
	Right tibiæ, mean index	Left tibiæ, mean index	Right and left tibiæ, mean index	Right tibiæ, mean index	Left tibiæ, mean index	Right and left tibiæ, mean index
Roebuck graves	52 (1)	56·33 (3)	55·25 (4)	63·56 (25)	61·92 (24)	62·76 (49)
Middleport ossuary	61·67 (6)	59·45 (11)	60·24 (17)	65·75 (8)	59·5 (4)	63·67 (12)

---

[1] The figures in brackets give the numbers of examples.

CHAPTER IV

SKELETAL REMAINS FROM THE GRAVES[1]

Altogether 84 skeletons were recovered from the graves of the Roebuck village site. As previously stated, most of them were in a state of preservation similar to that of Iroquoian skeletons from graves and ossuaries in sandy soil in other parts of Ontario. Some few from graves on ground lower down the hill and nearer the swamp were poorly preserved, this probably owing to the damper condition of the ground and the poorer drainage. These skeletons are divided into adults and non-adults—the latter class comprising children and those individuals who had not attained their full growth. There are 43 adults and 41 non-adults. By using as a guide the development of the bones and the eruption of the teeth the writer has attempted to ascertain the ages of the children and those not fully adult. In doing so, the development of European children has been taken as a standard. Indian children, however, develop more rapidly than do the children of white parents. Hence the following table will be in most cases probably an underestimate of the respective ages. Nevertheless it will serve to give some idea as to the distribution, in point of ages, of the mortality among the children.

Ages of Non-adult Remains

Age	Number of individuals	Age	Number of individuals
18–19 years	3 (probably all females)	5 years	1 (sex doubtful)
17–18 “	1 (probably male)	4– 5 “	1 “
16 “		4 “	1 “
14–15 “	2 (sex doubtful)	3– 4 “	1 “
13 “		3 “	1 “
11–12 “	1 “	2 “	2 “
11 “	2 “	20–24 months	1 “
10 “		20 “	1 “
9 “	1 “	10–15 “	1 “
8 “	1 “	9–12 “	2 “
7 “		6–9 “	1 “
6 “	5 “	At or soon after birth	7 “
5– 6 “	5 “		

Of these 41 skeletons only two were found that presented pathological conditions: both are children about eleven years old. In one (Cat. No. XIII. F. 5) there is present extensive destruction of the lumbar vertebræ and sacrum—the result of acute inflammation at this point. In the other case (Cat. No. XIII. F. 244) there is a hole, partly healed, through the right os innominatum into the right sacro-iliac joint, and, accompanying this, there has been acute inflammation of the joint at this place with destruction of the bone.

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[1] For the detailed measurements and indices *See* Appendices I and II, pages 55–69.

There are 43 skeletons of adults. Of these only 4 are those of men, the remaining 39 the writer has decided are those of women. It was a difficult matter to determine satisfactorily the sex of several of these skeletons—especially in cases where the remains were in a poor state of preservation. In three cases (Cat. Nos. XIII. F. 184, 194, and 198) the crania exhibited marked masculine characters, whereas the heads of the long bones were of slight and feminine build. In two cases (Cat. Nos. XIII. F. 22 and 187) the characters of the crania and long bones were intermediate between the sexes. The crania might be regarded as masculine with certain feminine characters or vice versa, and the heads of the long bones were of a size commensurate either with a large female or a moderate-sized male. The pelves in these cases were too fragmentary to aid much in the diagnosis. In one (XIII. F. 184) the sacro-sciatic notch was of feminine form; in XIII. F. 198 it was of male shape; in XIII. F. 194 the pelvis was so fragmentary that the shape of the notch could not be determined. In XIII. F. 197 the notch was of intermediate form; in XIII. F. 22 it was also of intermediate form but somewhat more feminine in shape. Skeleton XIII. F. 255 was another that proved difficult to diagnose. The cranium was very defective; so far as could be judged the sexual characters were of intermediate type. The pelvis was too fragmentary to be of any assistance. The humeri were slight in build but very long, and the heads of a size large for the bones of a female. The femora were long and the heads large enough to include them without hesitation in the male series had it not been for the characters of the rest of the skeleton.

On deliberation the foregoing examples have been considered to be the skeletons of females. XIII. F. 22, 184, 187, 194, and 198 all belong to elderly individuals, and the masculine characters that may be seen in some of the younger female skeletons have probably become more pronounced with age in these five cases. As regards the size of the long bones, we know from historical evidence[1] that there were tall, powerful women among the ancient Iroquoian tribes, and the active, hard-working life of the Indian woman results in a strong and muscular physique. In several of the skeletons here that are undoubtedly those of women—the skeletons being complete enough to afford a clear determination—the crania exhibit characters of a masculine type; one (Cat. No. XIII. F. 239) has a bizygomatic width of 148 mm., which would be large for a man; and several possess very strongly marked brow ridges.[2] In several of the female skeletons also the articular heads of the long bones are of large size. On the whole, one is impressed by the fact that the diagnosis of sex from the cranium or long bone alone must be now and then a very doubtful matter, even though with experience it may generally be determined with considerable accuracy. Even in the present case, with the skeletons as complete as can be generally expected, several of them present quite a puzzle.

If our determination of sex is correct there are only 4 men represented among the 43 adult skeletons.

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[1] *See* extract from Champlain on p. 30.

[2] XIII. F. 21 and 190 are particularly marked in this respect.

One (XIII. F. 183) is a man of over middle age. The masculine characters of the cranium and skeleton are well marked. The facial part of the skull is missing. The right humerus is 326 mm. in length. The right femur is 450 mm. in straight length; 447 mm. oblique length. The right tibia is 386 mm. in length, including tibial spine; 382 mm. with the spine excluded.

The second (XIII. F. 17) is the well-preserved skeleton of a man of over middle age. Evidently he was a powerful, strong-boned, broad-chested man. The right humerus is 350 mm. in length. The right femur is 477 mm. in straight length; 472 mm. oblique length. The right tibia 414 mm. in length, including the tibial spine; 406 mm. excluding the spine. The face is of somewhat unusual type; the malar bones are small for an Indian and do not project to the same extent as is usual. The writer has noticed the not unusual occurrence among Iroquoian crania of this comparatively slight-faced type.

The remaining two men were probably of young middle age. One (XIII. F. 259) is represented only by the lower limbs, the upper part of the skeleton being missing. The right femur is 467 mm. in straight length; 464 mm. oblique length. The right tibia is 392 mm. in length, including the tibial spine; 389 mm. excluding the spine. The other (XIII. F. 251) is represented only by the skull and some fragments of the upper part of the skeleton. The frontal ridges are not much marked. The malar bones are stout and projecting. The nasal index is lower than is usual among Iroquoian crania. On the internal surface of the occipital bone of this skull there is a large, rough, bony growth, whereas on the outer surface at this point the bone is porous and there is present a small inflammatory patch.

Notes on the general pathology of these skeletons are included in the pathological survey of the whole adult series (Appendix III). The distribution of their cranial measurements is contained in Appendix I.

It is noteworthy that there are so few men among this series of skeletons—39 of the 43 adult skeletons being those of women. Possibly in the unsettled state of existence at that time, as evidenced by the skeletal remains in the refuse deposits, the men of the tribe during the occupation of this site may have usually met their end when engaged on war forays, for as we have already seen from the survey of the scattered bones among the ashes, the majority of the individuals represented by these remains were men young or in the prime of life. If this theory seems untenable, it must be concluded that there was some other method of burial in use, one applicable only to the men, although the presence of the few male skeletons among the burials, and the fact that they include men of various ages, seems to render this unlikely.

There are 39 skeletons of adult women. An attempt has been made to group them into life periods as follows.

Young	Under middle age	Middle age or over	Elderly and aged
7	8	11	13

Their measurements are tabulated in Appendices I and II. From an inspection of the tables there given it will be seen that there is considerable variation in respect to the measurements and indices among this series of crania. Taken generally, the crania are in the mesaticephalic class, but tend towards brachycephalism. The mean cephalic index is practically 78. The mean vertical index is 73·48, which is inclined toward tapeino-cephalism, but the majority are in the metrio-cephalic class. Leptorrhine noses are represented, but the mean nasal index is 52·29, and 12 out of 24 crania are in the platyrrhine class as regards their nasal forms. There are two instances of prognathic crania (according to Flower's Alveolar Index), but the mean index is practically 99, which is mesognathic. The mean orbital index is roughly 87. In the whole series both microsemic and megasemic orbits are found, but on the average they are mesosemic. The variation of the palato-maxillary index is very considerable: in six female crania it ranges from 111 to 133, giving a mean of 123·17. The mean facial index is 52·82. There are only two instances —with indices of 48—that fall below 50. There are several instances of crania in which the malar bones are somewhat slight and not as strongly everted as is usual in Indian crania. This character has been noticed occasionally among the crania of Iroquoian tribes elsewhere in Ontario. As a contrast there are many instances of large, strongly everted, malar bones in this series: one female skull has a bizygomatic width of 148 mm., a measurement extremely large for a woman and in this case larger than any of the bizygomatic measurements in the male series. Taking this series of female crania generally, the nasal bridge as a whole is broad, the nasal bones broad also. The level of the nasal bones at the root is not high and is occasionally very flat. The lower margins of the nasal aperture are rounded, as a rule, but there are a few cases in which these margins are sharp—as in European crania. In two cases there are slightly marked pre-nasal fossæ.

The glenoid fossæ are, with only two exceptions, of good or medium depth. The musculature of the head is usually well marked, the mastoid processes in many cases strong and large.

In the majority of cases the occiput tends to be prominent, and there are no evidences of any artificial deformation among the series of crania. The forehead is of only medium height and in many cases low; in quite a number of cases among the female crania the writer noted it as being retreating, and, usually in conjunction with this character, there are several cases in the female series in which the brow ridges are exceptionally large and prominent. Heavy brow ridges occur quite commonly—more especially of course among male crania—in the crania of Iroquoian tribes elsewhere in Ontario. In the series of male crania from Roebuck there are none that approach in respect to the size of their brow ridges many crania from other Ontario sites, but the male series here is very small in numbers. Seeing the occurrence of massive brow ridges among the women of this village, it may be presumed that this character was to have been found among the men too.

Appendix I, table 26, deals with the observations on these crania, treating them, so far as it is possible to do so in the case of observations of this kind, in a statistical manner.

Appendix III gives the results of an examination into the pathology of the skeletons. The most striking fact is the evidence as to the prevalence of arthritic conditions in the adult skeletons of these Indians. It would not have been surprising to have found arthritic conditions in the joints of the elderly members of the tribe, as these conditions are common in old age as the results of degenerative changes in the bones. There are also to be taken into consideration, in the case of primitive peoples, the probable effects on the frame of a hard life and exposure to the weather. It is certainly surprising, however, to see in these skeletons at what an early age arthritis has developed. Four out of the eight skeletons of young women show decided arthritic conditions, and these conditions becoming more pronounced and more general with advancing years only two out of the thirteen elderly women seem to have escaped the ravages of this disease. In the case of one of the young women (XIII. F. 248) arthritis is very advanced, two of the dorsal vertebræ being already anchylosed by the overgrowth of bone on their margins; many of her back teeth too have dropped out during life.[1] Yet the evidence of the pelvic rims shows that she must have only lately reached her full growth. Nodes that occur on two of the tibiæ of these skeletons, the results of slow inflammation of these points, may probably be referred to an arthritic condition.

The second noteworthy point is the prevalence of teeth affected by caries accompanied by abscesses and inflammation in the gums. The figures are as follows:

—	Number of teeth	Number affected by caries	Percentage affected by caries
2 older men	36	13	25·8
1 younger man	26	3	
13 elderly women	133	47	35·3
11 middle aged women	186	85	45·7
8 women under middle age	179	43	24
7 young women	179	32	17·9
Total of adult series	739	223	30·2
Fully erupt permanent teeth in the non-adult series	224	19	8·5
Total permanent teeth	963	242	25·1
Partly erupt permanent teeth in the non-adult series	61	2	3·3
Fully erupt temporary teeth	267	46	17·2
Partly erupt temporary teeth	15	....	....

Although caries of the teeth is so prevalent there are several instances of good sets of teeth among the non-adult series. The writer will present these examples individually and as a contrast illustrate some examples showing the reverse state of things.

Good Sets of Teeth

XIII. F. 29	Probably female, not quite adult	*Upper Jaw:* Perfect set of teeth, 14 fully erupt teeth and 2 partly erupt, all sound. *Lower Jaw:* 12 sound teeth, 2 affected by caries.
XIII. F. 5	11 years old	*Upper Jaw:* 11 fully erupt permanent teeth, all sound, 3 partly erupt permanent teeth, sound. *Lower Jaw:* 9 fully erupt permanent teeth, all sound, 4 partly erupt permanent teeth, sound.

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[1] Possibly due to pyorrhœa alveolaris.

XIII. F. 7	14–15 years old	*Upper Jaw:* 14 fully erupt permanent teeth, all sound. *Lower Jaw:* 14 fully erupt permanent teeth, all sound.

Bad Sets of Teeth

XIII. F. 16	Probably female, 18–19 years old	*Upper Jaw:* 14 fully erupt permanent teeth, sound, 2 fully erupt permanent teeth, affected by caries and abscesses at the roots. *Lower Jaw:* 9 fully erupt permanent teeth, sound, 1 fully erupt permanent tooth affected by caries. Gums in bad state in the molar region. About 4 molars have been lost during life, and there have been inflammation and abscesses at their roots.
XIII. F. 12	14–15 years old	*Upper Jaw:* 11 fully erupt permanent teeth, sound; 3 fully erupt permanent teeth affected by caries.[1] *Lower Jaw:* 8 fully erupt permanent teeth, sound; 4 fully erupt permanent teeth, affected by caries; inflammation at the roots of a molar affected by caries; first left molar has been lost during life.
XIII. F. 4	About 3 years old	*Upper Jaw:* 2 temporary teeth, sound; 8 temporary teeth affected by caries. *Lower Jaw:* 6 temporary teeth, sound; 4 temporary teeth affected by caries.

The early age at which caries of the teeth sets in is evident from the number of the temporary teeth that are affected. XIII. F. 4, a child of about 3 years of age, affords an instance of how extensive caries may be in the temporary set of teeth. The figures for the different age periods in the adults show the progressive nature of the decay. The young women have only 17·9 per cent teeth affected by caries; the middle aged 45·7 per cent.

Many cases occur in which some of the teeth have been lost during life; possibly this indicates the disease of pyorrhœa alveolaris. It is probable that there is a connexion between the condition of the mouth and the prevalence of arthritic conditions in the skeletons of this tribe, the two complaints probably interacting.

There is an interesting observation by Roger Williams[2] in 1643 on toothache among the New England Indians. "Which is the onely paine will force their stout hearts to cry;—but the paine of their women's childbirth—never forces their women so to cry, as I have heard some of their men in this paine."

Probably caries of the teeth was general among the eastern agricultural Indians.

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[1] At the base of the first right incisor there is a supernumerary tooth appearing on the labial margin of the maxillar.

[2] A key into the language of America or an help to the language of the Nations in that part of America called New-England by Roger Williams of Providence in New-England, London 1643, p. 50.

CHAPTER V

COMPARISON BETWEEN SKELETAL MATERIAL FROM ROEBUCK AND FROM SURROUNDING TERRITORY

For comparison with the more important of the measurements and indices of the Roebuck remains, the following tables give data from three other distinctive groups of skeletal remains from Ontario. This gives four groups as follows:

(1) Skeletal remains from graves on the Roebuck site.

(2) Skeletal remains from an ossuary connected with a village site of pre-European date just outside the present village of Middleport, Brant county, Ontario. Crania and long bones were obtained from this ossuary by the writer when on field work for the Geological Survey, Canada, in 1912. As the site is pre-European and in the former territory of the Neutral nation, it is very probable it was formerly inhabited by a tribe of Neutral Indians.

(3) Skeletal remains from two known Huron ossuaries, and from three others that were probably Huron.[1] Measurements of this material were taken by the writer, through the courtesy of Dr. R. B. Orr, from the skeletal collection in the Provincial Museum, Toronto; and through the courtesy of Dr. C. T. Currelly, from the collection of Sir Daniel Wilson in the Royal Ontario Museum of Archæology, Toronto. Five ossuaries are represented in this group. They are as follows:

(1) Ossuary in Innisfil township,[2] Simcoe county: of doubtful age. 15 adult crania were measureable.

(2) Ossuary in Flos township,[3] Simcoe county: of doubtful age. 2 adult crania were measureable.

(3) Ossuary in Vaughan township,[4] York county: of doubtful age. 40 adult crania were measureable.

(4) Ossuary in Markham township,[5] York county: of doubtful age. 8 adult crania were measureable.

(5) Ossuary in Manvers township,[6] Durham county: of pre-European age. 29 adult crania and 6 adult long bones were measureable.[7]

(4) Skeletal remains from mounds in Peterborough county, viz., in Otonabee and Asphodel townships and on the north shore and islands of Rice lake. These mounds were the burial place of an Indian people, possibly Algonkian, in pre-European times. Of this group, 8 male and

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[1] *See* footnote 2, p. 15.

[2] Ont. Arch. Rept. 1899, pp. 2 and 26.

[3] Ont. Arch. Rept. 1886, p. 57; 1889, p. 44; 1892-5, p. 42; 1894, pp. 17-18; vol. 36, p. 246.

[4] Ont. Arch. Rept. 1889, pp. 20 and 44.

[5] Article entitled "The Red Man" in the Globe, Toronto, May 24, 1881, p. 6, col. 1.

[6] Ont. Arch. Rept. 1894, pp. 17-18, 41.

[7] All the material from these five ossuaries is now in the Royal Ontario Museum of Archæology, Toronto.

3 female crania, and 61 long bones were collected from the "Serpent"[1] mound, Otonabee township, by Professor H. Montgomery, Ph.D. The remainder of the mound crania included in the group were collected by Dr. David Boyle from various mounds on the north shore and islands of Rice lake,[2] from the Sugar Island mounds,[3] from a mound at Roach point, Rice lake, and from Preston mound,[4] near Hastings, Asphodel township, Peterborough county. Dr. Boyle also collected a series of 13 long bones from the "Upper Miller"[5] mound, Otonabee township, Peterborough county.[6]

Before proceeding to the comparison between the Roebuck and other groups the Huron group will be discussed.

Only two of the five ossuaries constituting this group are in the historic Huron territory; these two are the ossuary in Innisfil township and that in Flos township, Simcoe county.

The other three ossuaries are at some distance from the Huron territory and the writer has, therefore, considered them as (?) Hurons.[7] For this reason group 3 is subdivided in the "Comparative Data" table, in one column tabulating the means of the measurements of the crania from the two Simcoe county ossuaries which are almost certainly Huron, in the second the means of the measurements of the Huron and Huron (?) crania taken together.

It seems as well to compare the means of some of the measurements and indices of the crania from these five ossuaries taken separately. Therefore, a table is given on page 16 showing the means of the cephalic, vertical, facial, and nasal indices, and of the bizygomatic widths and nasal measurements of this series.

This table shows various differences among the indices of the five groups of crania, although perhaps they cannot be considered wide enough definitely to break up the "Huron" group. In the cephalic index series the most noteworthy is the low index of the male crania from Vaughan ossuary and the fact that the mean cephalic index of the female crania from this ossuary is so much higher, being the same as that of the female crania from Manvers ossuary. Possibly differences of this sort that occur between the sexes in various Iroquoian groups, if not due to the small numbers available, may be owing to inter-tribal warfare and the capture of women of hostile tribes, or peaceful relations and intermarriage with neighbouring tribes. On account of the low cephalic index of the Vaughan male crania and its similarity to the cephalic index of the crania from New York state, as well as on account of the male cranial type *(See* page 43) the writer does not feel very sure as to the Huron origin of this ossuary; still it must be admitted that this dolichocephalic type may be Huron.[8]

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[1] Trans. Can. Inst., vol. IX, pt. 1; Ont. Arch. Rept. 1896–7, pp. 19–26, 67.

[2] Ont. Arch. Rept. 1896–7, pp. 14–41, 67–79.

[3] Ont. Arch. Rept. 1896–7, pp. 33–35, 62–64.

[4] Ont. Arch. Rept. 1896–7, p. 35.

[5] Ont. Arch. Rept. 1896–7, p. 28.

[6] The skeletal remains from all these mounds are in the Royal Ontario Museum of Archæology.

[7] Archæological remains found with them leave no room for doubt that they are Huron sites [W. J. Wintemberg].

[8] Possibly the explanation of the various differences between these ossuaries may be the differences in Huron physical type at different periods of time, associated with relations with varying neighbouring tribes.

Huron and (?) Huron Crania (Male)

Ossuary	No.	Cephalic index	No.	Vertical index	No.	Upper facial index	No.	Nasal index[1]	No.	Bizygomatic width	No.	Nasal height	No.	Nasal width
Innisfil tp., Simcoe co..........	11	75·55	11	75·27	4	55	6	48·83	7	140·43	6	56·33	6	27·42
Flos tp., Simcoe co............	2	74·5	2	73·5	1	52	1	44	1	139	1	57	1	25
Vaughan tp., York co..........	26	73·27	14	74·21	5	51·4	8	49·63	15	140·6	8	54	8	26·81
Markham tp., York co.........	4	76·25	4	73·75	3	53	4	49·25	3	142·33	4	56·75	4	27·88
Manvers tp., Durham co.......	19	76	15	73·6	8	52·13	13	47·85	13	142·85	13	55·46	13	26·54

[1] Nasal height measured from nasion to akanthion.

Huron and (?) Huron Crania (Female)

Ossuary	No.	Cephalic index	No.	Vertical index	No.	Upper facial index	No.	Nasal index[1]	No.	Bizygomatic width	No.	Nasal height	No.	Nasal width
Innisfil tp., Simcoe co..........	4	78	4	75·75	3	52	2	50·5	4	127·75	2	50	2	25·5
Flos tp., Simcoe co............	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....
Vaughan tp., York co..........	14	76·79	8	73·5	1	59	2	53·5	5	130·4	2	52·5	2	27·75
Markham tp., York co.........	4	74·75	4	74·25	1	51	3	54·67	2	125·5	3	47	3	25·67
Manvers tp., Durham co.......	10	76·6	10	74·5	3	49·67	7	51·57	6	132·7	7	52	8	26·44

[1] Nasal height measured from nasion to akanthion.

In the series of nasal indices the low nasal index of the Manvers crania arrests one's attention. The teeth from the ossuary in Manvers township agree with the other Iroquoian series with regard to the prevalence of decay, and are a strong contrast in this respect to those from the mounds (*See* page 15). In the upper facial index, too, Manvers crania are similar to the other Iroquoian groups.[1]

In the collection of the Provincial Museum, Toronto,[2] there are a few long bones from (?) Huron ossuaries. They are too few in number to help in the present research in the matter of the comparative statures of the Iroquoian tribes, but the measurements of these bones are given here as they may later prove of value when combined with further data.

(1) Long bones from an ossuary in Manvers township, Durham county:
  2 right femora (maximum length) 505 mm. and 461 mm.
  1 right tibia (including spine) 414 mm.
  2 left tibiæ (including spine) 428 mm. and 416 mm.
  1 left tibia (including spine) 375 mm.

(2) Long bones from an ossuary in York township, York county:
  1 right femur (maximum length) 456 mm.
  3 left femora (maximum length) 490 mm., 478 mm., and 455 mm.

Turning again to the Roebuck data, the tables on pages 18 and 19 show the comparison between the four groups selected.

The comparison of the female skeletal remains will be discussed first, as the male skeletal material from Roebuck is too scanty to be of much value. It is evident that, so far as the cephalic, facial, and nasal indices are concerned, there is much similarity between the three Iroquoian groups—groups Nos. 1, 2, and 3. With the exception of the glabello-occipital length and basi-bregmatic height, the absolute measurements of the crania of the Roebuck women are slightly greater than the corresponding measurements of the Huron and Middleport women, but this may be due to a more correct diagnosis of sex in the case of the Roebuck remains, as among them are included crania that if found disassociated from the rest of the skeleton (as would be the case in ossuary burials) might easily pass as those of males. So far as our present series goes, the Roebuck women in their facial and nasal indices show a closer resemblance to the Middleport than to the Huron women. The Middleport female long bones are too few in number to compare satisfactorily with the Roebuck series, but on the whole the long bones of the two groups seem much alike in point of size.

The crania from the mounds are very few in number, but, taking them as they are, all three indices of this group show dissimilarities from those of the Iroquoian groups. In the case of the facial and nasal indices it is not unlikely that the differences may be significant—notwithstanding the small number of mound crania—as the male crania from the mounds when compared with the male Iroquoian crania show the same differences. With regard to the difference in the cephalic index the male series does not support the female. The long bones from the mounds are too few in number and the mean lengths contradictory: the mean length of the

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[1] For further discussion on these two ossuaries *See* pp. 43, 51.

[2] Now removed to the Royal Ontario Museum of Archæology.

Roebuck and Comparative Data

(Male Crania)

—	1		2		3				4		
	Roebuck village site		Middleport ossuary		2 Huron ossuaries		2 Huron and 3 (?) Huron ossuaries		Mounds in Peterborough county		
	No.	Mean	No.	Mean	No.	Mean	No.	Mean	No.	Mean	σ
Glabello-occipital length	3	188·67	9	186·67			63	188·22	15	188·13±1·26	7·22±0·89
Maximum breadth	3	147	8	143·38			62	140·5	16	142·75±0·81	4·79±0·57
Cephalic index	3	78	8	77	13	75·38	62	74·74	15	76·07±0·71	4·09±0·5
Basi-bregmatic height	2	142	7	137·57			46	139·67	13	136·08±0·55	2·95±0·39
Vertical index	2	74·5	7	74·29			46	74·2	12	72·25	
Bizygomatic width	3	144	6	145·67			39	141·41	10	142·8	
Upper facial height	2	75·5	6	75·83			28	73·83	11	70·27	
Upper facial index	2	52	5	51·4			21	52·62	7	49·57	
Nasal height (nasion-akanthion)	2	56·5	7	56	7	56·43	32	55·5	12	54·25±0·41	2·09±0·29
Nasal width	3	28	7	27			32	27·25	12	25·88±0·35	1·79±0·25
Nasal index	2	48	7	49·29	7	48·14	32	48·53	12	47·92±0·67	3·43±0·47

Roebuck and Comparative Data

(Female Crania)

—	1			2			3				4	
	Roebuck village site			Middleport ossuary			1 Huron ossuary[1]		1 Huron and 3 (?) Huron ossuaries		Mounds in Peterborough county	
	No.	Mean	σ	No.	Mean	σ	No.	Mean	No.	Mean	No.	Mean
Glabello-occipital length	25	178·64±0·75	5·53±0·53	16	177·5 ±0·67	4·00±0·48			32	179·16	5	183·8
Maximum breadth	25	138·84±0·55	4·05±0·39	14	137·64±0·82	4·56±0·58			32	137·19	5	136·4
Cephalic index	24	77·88±0·36	2·59±0·25	14	77·43±0·43	2·38±0·3	4	78	32	76·63	5	75·6
Basi-bregmatic height	21	131·43±0·85	5·77±0·6	14	132·93±0·91	5·02±0·64			26	133·27	5	134·4
Vertical index	21	73·48±0·53	3·61±0·38	14	74·43±0·52	2·87±0·37			26	74·35	5	74·4
Bizygomatic width	23	132·26±0·84	4·91±0·49	11	130·45±1·34	6·59±0·95			17	129·82	3	131
Upper facial height	20	69·5 ±0·6	3·96±0·42	9	67·22				12	67·58	4	66
Upper facial index	17	52·82±0·39	2·36±0·27	8	52·25		3	52	8	51·88	3	51
Nasal height (nasion-akanthion)	26	51·38±0·41	3·1 ±0·29	10	50·2 ±0·69	3·22±0·49	2	50	14	50·71	4	51·25
Nasal width	24	26·88±0·29	2·08±0·2	10	26·06±0·43	1·99±0·3	2	25·5	15	26·6	4	25
Nasal index	24	52·29±0·57	4·14±0·4	10	52·2 ±0·85	3·82±0·58	2	50·5	14	52·36	4	48·75

[1] There are female crania from Innisfil township ossuary only, not from Flos township ossuary.

Roebuck and Comparative Data

Length of the Long Bones, Male

——	—	Humeri		Femora (maximum length)		Femora (oblique length)		Tibiæ (spine included)		Tibiæ (spine excluded)	
		No.	Mean	No.	Mean	No.	Mean	No.	Mean	No.	Mean
Roebuck village site	Right	2	338	3	464·7	3	461	3	397·3	3	392·3
	Left	2	332·5	3	462	3	458·7	2	402	2	395·5
Middleport ossuary	Right	11	331·1	7	463·29	7	459·14	6	394	6	389·17
	Left	11	331·55	8	465·5	8	462·38	11	391·82	11	387·45
Serpent mound, Otonabee	Right	10	336·3	7	458	......	....	8	393·5	......	....
	Left	8	329·38	8	466·62	......	....	5	394·8	......	....
Upper Miller mound, Otonabee	Right	......	....	4	496·25	......	....	2	415	......	....
	Left	......	....	2	506	......	....	2	415	......	....
Both mounds combined	Right	......	....	11	471·91	......	....	10	397·8	......	....
	Left	......	....	10	474·5	......	....	7	400·57	......	....

Length of Long Bones, Female

——	—	Humeri		Femora (maximum length)		Femora (oblique length)		Tibiæ (spine included)		Tibiæ (spine excluded)	
		No.	Mean	No.	Mean	No.	Mean	No.	Mean	No.	Mean
Roebuck village site	Right	24	305·75	26	428·81	17	423·06	17	360·88	9	355·22
	Left	21	302·38	25	431·24	18	422·67	17	362·82	13	357·92
Middleport ossuary	Right	4	302·75	5	426·6	5	418	8	367	8	360·5
	Left	5	307	5	449·8	5	443·2	4	366·5	4	361·75
Serpent mound, Otonabee	Right	2	323	4	440·75	......	....	3	370	......	....
	Left	1	314	2	424·5	......	....	3	358·67	......	....
Upper Miller mound, Otonabee	Right	1	311	......	....	......	....	......	....	......	....
	Left	......	....	1	435	......	....	1	359	......	....
Both mounds combined	Right	3	319	......	....	......	....	......	....	......	....
	Left	......	....	3	428	......	....	4	358·75	......	....

mound humeri are greater than the mean humeral length of the Iroquoian series, but the femora and tibiæ show no great differences.

Turning now to the male groups, the cephalic index shows a similarity between the Roebuck and Middleport series—the Huron crania being distinctly more dolichocephalic than the others. The mound crania show a cephalic index intermediate between the Huron and the other two groups.

The facial index of the Huron group is higher than that of the other Iroquoian groups. The mound crania, as in the female series, show the lowest index of the four groups.

The nasal index is in the male as well as in the female groups smaller in the mound crania than in the Iroquoian, for in both male and female crania the nasal width averages about 1 mm. smaller than the nasal width of the Iroquoian groups. The Middleport male nasal index is higher than that of the Huron group, whereas in the female crania the reverse is the case. The Roebuck male crania are too few in number to be of much value for comparative purposes, but it is interesting to see that even in the case of only two crania the mean nasal index very closely approximates that of the other two Iroquoian male groups.

The long bones show striking similarities in average size between the Roebuck and Middleport series. Long bones from Manvers township ossuary and York township ossuary are too few in number to allow of any satisfactory comparison. Taking them as they are, most of these (?) Huron bones are very long and are evidently those of men of tall stature. Still, in a small series such as this, there is always the possibility of their selection on account of their size.

In the case of the mound long bones the evidence is rather conflicting. The male long bones from the "Serpent" mound are similar in average length to the male Iroquoian long bones, but the few male femora and tibiæ from the "Upper Miller" mound are greatly superior in size to either the Iroquoian or "Serpent" mound series. Either the "Upper Miller" mound was the burial place of some exceptionally tall men of these Rice Lake Indians or else there was some definite physical distinction between the people who interred in the "Serpent" mound and those who used the "Upper Miller" mound. From the "Upper Miller" mound there are three female long bones—a right humerus, a left femur, and a left tibia; comparing these with the other female series these long bones are of fairly average size. There are no crania from the "Upper Miller" mound; otherwise a comparison between the crania at the "Upper Miller" and "Serpent" mounds might have assisted in the solution of the problem of the difference in size of the male long bones. Seeing that the "Upper Miller" mound men are so few in number it is possible that they are of the same people as those of the "Serpent" mound, but of unusual stature. Evidently, however, we have as yet too few long bones from the mounds to base any sound conclusions as to how the stature of these peoples compares with that of the Iroquoian tribes. It is interesting though to see that in the larger series of long bones from the "Serpent" mound, we have a people of stature pretty similar to that of the Roebuck and Middleport Iroquois. Possibly there may have been little difference in stature among the various Indian tribes of the region under examination.

Lengths of the Longest Humeri, Femora, and Tibiæ among the Remains of Iroquoian and non-Iroquoian Tribes

—	Length of humerus	Length of femur		Length of tibia	
		Max. length	Oblique length	Including spine	Excluding spine
	mm.	mm.	mm.	mm.	mm.
Tallest Roebuck man (Cat. No. XIII. F.17)	350 (R)[1]	477 (R)	472 (R)	414 (R)	406 (R)
Tallest Roebuck woman (Cat. No. XIII. F. 255)	348 (R)	476 (R) 486 (L)[2]	....	....	....
Longest male bones from Middleport ossuary[3]	351 (R)	486 (R)	481 (R)	428 (R)	423 (R)
Longest male bones from Manvers ossuary[3]	....	505 (R)	....	416 (L)	
Longest male bones from the "Serpent" mount, Otonabee[3]	348 (R)	481 (L)	....	414 (R)	....
Longest male bones from the "Upper Miller" mound, Otonabee[3]	....	516 (L)	....	416 (R)	....

As a result of the analysis of the comparative tables of crania and long bones it can be said that the Roebuck people were in physical type Iroquoian, with a closer resemblance to the people of the pre-European village site at Middleport—who were probably Neutrals—than to the Hurons. All three Iroquoian groups differ from the Indians of Rice Lake district in having broader noses and longer faces.

The difference in the width of the nose is of very great interest. The researches of Professor Arthur Thomson and Dr. L. H. Dudley Buxton[4] have shown that the width of the nose is affected by climate, and that—speaking broadly—wide noses are the rule in moist, hot climates, narrow noses in cold, dry climates.

Among the Ontario peoples who are the subjects of the present research, the various Iroquoian tribes all have, on the average, broad noses, which would accord with a southern origin.

ADDITIONAL MEASUREMENTS OF IROQUOIAN LONG BONES

With regard to the question as to the comparative statures of the Iroquoian peoples, more data is necessary from skeletal remains in Ontario itself, and we have none at all from the skeletal remains in New York state. It has not been possible, therefore, to do more than compare the series from Roebuck and Middleport village sites, and these as it happens are similar in point of size.

On page 17 the measurements of a few "Huron" long bones were given in case they might be of use later, with the collection of further series of Iroquoian long bones. With the same purpose in view some measurements of Iroquoian long bones obtained from the former Neutral territory will be included here. One series is from a post-European, and, therefore, probably Seneca, village site in Brant county; the other from an ossuary of doubtful age at Sherks, in Welland county.

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[1] Right bone.
[2] Left bone.
[3] These bones do not necessarily belong to one and the same skeleton.
[4] Proceedings of the International Medical Congress, 1912; and "Man's Nasal Index in Relation to Certain Climatic Conditions." by Arthur Thomson, M.A., M.B., and L. H. Dudley Buxton, M.A.; Jour. Roy. Anthrop. Inst., vol. LIII, Jan.-June, 1923.

The first site is situated in Onondaga township, Brant county, and is about 3 miles north of Middleport. Probably it is the same as that called the "Walker Farm Site" from which one of the crania was obtained that has been included in the foregoing table. The writer visited this site in 1912 and found some skeletal remains—mostly fragmentary—in a small pit at the foot of a pine stump. It seems fairly certain that these had been exhumed and later re-buried by former excavators. Much digging has been done at this site, and much archæological material has been obtained from it. The writer brought away the few whole long bones that he came across. These and their measurements are as follows:

Humeri

1 male adult left humerus	length 333 mm.
1 female adult left humerus	length 295 mm.

Femora

Three right femora, all probably male	maximum length 463 mm., 444 mm., 443 mm.
1 female adult left femur	maximum length 428 mm.

Tibiæ

1 male left tibia	length (including spine) 374 mm.
1 female right tibia	length (including spine) 427 mm.
1 possibly female right tibia	length (including spine) 388 mm.

Teeth collected at this site give the following figures:

	Sound	Affected by caries
Adult permanent teeth	49	12
Permanent teeth not fully erupt	2	..
Temporary teeth	2	2

The second series is from an ossuary at Sherks, Welland county.

When in Buffalo in 1915, Mr. William L. Bryant of the Buffalo Society of Natural Sciences kindly took the writer to visit the site of the ossuary at Sherks, Welland county, from which there had been obtained some skeletal material in the collection of the Buffalo Society of Natural Sciences. Upon arriving at the spot we found that a light railway had been driven through this ossuary, and that the bones consequently were much broken up and disturbed. Four crania rather damaged, and a few whole long bones were obtained. The indices of the crania combined with those of the crania from the same ossuary in the collection of the Buffalo Society of Natural Sciences are given in the table of the cephalic indices of crania from ossuaries of the former Neutral territory, under "Ossuaries of doubtful age" *(See* pages 36, 39).

The measurements of the long bones from this ossuary are as follows:

Humeri

2 male right humeri, 332 mm. and 306 mm.
4 female right humeri, 324, 301, 290, and 278 mm. 1 female left, 288 mm.
Mean of the 4 female right humeri is 298·25 mm.

Femora

2 male right femora: maximum length, 453 and 446 mm.; oblique length, 449 and 442 mm.
2 male left femora: maximum length, 483 and 474 mm.; oblique length, 480 and 470 mm.
Mean length of the 4 male femora is 464 mm., which corresponds to the mean length of the male Roebuck and Middleport femora.

Tibiæ

1 male right tibia (including spine) 363 mm.; (excluding spine) 360 mm.
1 male left tibia (including spine) 365 mm.

CHAPTER VI

STATURE OF THE ROEBUCK IROQUOIS

The most certain method by which one could arrive at an estimate as to the stature of the Roebuck Iroquois would be a comparison between the average lengths of their long bones and the averages of other long bones of Indians whose stature was known. Next in value to this would be a comparison with European or other long bones belonging to populations whose average stature was known. Unfortunately the writer can find no data that would fulfil the conditions necessary for the first method and little that will help as regards the second. What evidence has been gathered for the solution of this problem is here given.

The following are the average lengths of the Roebuck long bones. The figures in brackets give the number of bones in each case.

—	Average length of right humeri mm.	Average length of right femora (maximum length) mm.	Average length of right femora (oblique length) mm.	Average length of right tibiæ (excluding spine) mm.
Roebuck (male)	338 (2)	464·7 (3)	461 (3)	392·3 (3)
Roebuck (female)	305·75 (24)	428·81 (26)	423·06 (27)	355·22 (9)

Dr. Ales Hrdlicka[1] gives the following figures for the average length of the long bones of Delaware Indians:

—	Right humeri (maximum length) mm.	Right femora (maximum length) mm.	Right femora (bicondylar length) mm.	Right tibiæ (excluding spine) mm.
Delaware (male)	325 (14)	458 (14)	452·6 (14	385 (12)
Delaware (female)	307 (15)	426·5 (13)	421 (13)	353 (14)

Comparing these with the Roebuck figures it is apparent that the Delaware men must have been rather shorter, but the women very slightly less in stature than the Roebuck Iroquois. Dr. Hrdlicka writes that judging from observations on whites and on other Indians, the mean bicondylar lengths of these Delaware femora correspond to an average stature of approximately 167 cm. in the men and 156 cm. in the women.

Turning to European data, the following are of interest.

For the modern French there are the following figures:[2]

—	Humeri mm.	Femora (oblique length) mm.
French (male)	323 (44)	441 (62)
French (female)	292 (39)	396 (38)

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[1] Hrdlicka, A.: Physical Anthropology of the Lenapes or Delawares; Smith. Inst., Bur. Am. Ethn., Bull. 62, p. 53 *et seq.*

[2] Pearson, K.: Mathematical Contributions to the Theory of Evolution; Phil. Trans., Roy. Soc., vol. 192, pt. A, p. 195 (1899).

Professor Karl Pearson[1] gives the following figures for modern French stature:

	Cm.
French average male stature	165·0
French average female stature	152·3

It is, therefore, evident that in the Roebuck Iroquois we have a people in stature well surpassing the modern French. Most unfortunately there are no statistics as to the average length of the long bones in the modern British, which would have been of help in this present inquiry. From Professor Karl Pearson's study of the long bones of the English skeleton[2] the following is extracted:

—	—	Right femora (max. length) mm.	Right femora (oblique length) mm.
Material (probably Seventeenth century, from London)	Male Female	446·77 (218) 410·11 (171)	444·35 (202) 406·43 (161)
Parson's Rothwell data (mediæval ?)	76 male 53 female	456 (76) 416 (53)	453 (75) 415 (52)
Hepburn's 43 British femora (all except 2 are male and probably Lowlands Scottish)	....	Right and left femora (oblique length) 456·8 mm.	

The Roebuck femora are superior in size to these figures, but unfortunately the statures of these British samples are not known. Scottish stature is very high. Deniker[3] gives average stature for 1,304 Scotchmen in general as 174·6 cm., but we have no means of knowing if the sample given by Professor Hepburn would represent the average Scottish stature. It probably does not, judging from the average length of femur given, and the fact of the inclusion of the female femora in the series.

Professor Pearson, reconstructing the stature of these mediæval English by means of his formulæ for the reconstruction of stature from the length of the long bones, judges that the people represented by these bones were not as tall as the modern English.

From Professor Pearson's[4] paper on the reconstruction of stature, the following figures for the average stature of the modern English are extracted:

—	—	Average stature cm.
English commonalty (Galton)	811 male 770 female	170·0 158·3
English middle classes (Pearson)	1,000 male 1,000 female	172·8 159·9

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[1] Ibid., pp. 192, 220.

[2] Pearson, K., and Bell, Julia: "A Study of the Long Bones of the English Skeleton"; Tables IV and V, Draper's Company Research Memoirs, Biometric Series X, Cambridge Univ. Press, 1919.

[3] Deniker, J.: Races of Man (2nd edition), Appendix I, London, 1906.

[4] Pearson: op. cit., p. 217.

From the same paper[1] the following figures for Anglo-Saxon long bones are taken:

—	—	Femora (max. length) mm.	Tibiæ mm.
Anglo-Saxons in general	65 male	471·7	390·5
	26 female	427·7	....
Wittenham peasantry	23 male	466·9	....
	17 female	422·4	....
	7 male with tibiæ	483·4	394·3

These figures show the Anglo-Saxon men to have probably been slightly superior in stature to the Roebuck men. It will be noticed that the Anglo-Saxon tibiæ in proportion to the femora are not as long as are the Roebuck tibiæ. This is due to the comparatively greater length of tibia in the Indian. It would probably have to be taken into account when comparing the long bones of Europeans and Indians with a view to determining the stature of the latter.

The Anglo-Saxon female femora are only 1 mm. shorter in average than the Roebuck female femora, so that presumably they would be much the same in stature (unless the greater length of the Iroquois tibia causes an appreciable difference in the comparative statures); but the sexual ratio for the Anglo-Saxon series is so high (1·096) that Pearson considers the Anglo-Saxon women either underestimated or possibly mixed with a Romano-British element.

The foregoing leaves us with the following information:

(1) The Roebuck men were rather taller but the women only slightly superior in stature to the Delaware group whose stature is estimated by Dr. Hrdlicka as 167 cm. for the men and 156 cm. for the women.

(2) The Roebuck Iroquois were evidently a good deal taller than the modern French.

(3) They were also taller than the series of mediæval English and modern Scottish individuals quoted here, but it does not seem probable that these would represent the modern average English and Scotch statures.

(4) They were probably shorter than the Anglo-Saxons.

Turning next to Professor Pearson's[2] formulæ for the reconstruction of stature from the length of the long bones, we get the following results on applying them to the Roebuck material.

Roebuck Men

Right bones	No.	Mean measurement in mm.	Stature in cm.
Humeri	2	338	168·5
Femur (maximum length)	3	464·7	168·7
Tibiæ (excluding spine)	3	392·3	171·9

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[1] Op. cit., p. 216.

[2] Op. cit., p. 196.

Roebuck Women

Humeri	24	305·75	155·7
Femora (maximum length)	26	428·81	156·2
Femora and humeri combined	19 pairs	F.428·8 H.307·8	156·46
Tibiæ (excluding spine)	9	355·22	158·3

It will be objected that the series of male bones are too small for an attempt at the reconstruction of male stature, but the writer was encouraged to include them seeing that the averages of their lengths corresponded so closely to the averages of the larger series of male long bones from Middleport ossuary. The Roebuck male right humeral average length is considerably larger than the Middleport average for the same bone, but the average for the Middleport left humeri indicates that the right humeri are a somewhat small sample; as for the femora and tibiæ, the series seem to be of identically the same size. On examining the table the first thing that strikes one is the correspondence between statures derived from the humerus and femur and the great superiority in the stature derived from the tibiæ. Professor Pearson's formulæ are based upon the measurements of a series of Europeans. The excess in the stature estimated from the tibia in the present series is, therefore, evidently due to the proportionately greater length of the Indian tibia.

The tibio-femoral index in the Roebuck series illustrates their greater tibial length. This index is based upon the proportion of the oblique length measurement of the right femora to the length of the tibiæ as measured without the spine.

Roebuck Tibio-femoral Index

Sex	No.	Minimum	Mean	Maximum
Male	2	84	85	86
Female	8	81	85	88

Dr. Hrdlicka[1] gives an average tibio-femoral index in whites of approximately 82 in males and slightly less in females, whence it is evident that the Roebuck tibiæ are, in proportion to the femora, longer than the tibiæ in a series of European long bones of similar humeral and femoral length. This has already been noted in the comparison between the Roebuck and Anglo-Saxon long bones. It is probable, therefore, that Pearson's formula for reconstruction of stature from the tibia would, in the case of the Indian, give too high a stature.

I have next taken the humero-femoral index of the Roebuck series in order to find out if there is any noticeable difference between the Indian and European in this respect. This index has been based upon the proportion of the maximum length of the right humerus to the oblique length of the right femora.

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[1] Hrdlicka, A.: Physical Anthropology of the Lenapes or Delawares; Smith. Inst., Bur. Am. Ethn., Bull. 62, p. 68.

Roebuck Humero-femoral Index

Sex	No.	Minimum	Mean	Maximum
Male	2	73	73·5	74
Female	14	70	72·8	76

Comparing this with Dr. Hrdlicka's[1] table it will be seen that the Roebuck humero-femoral index is very similar to the humero-femoral index in various white groups.

With regard to the humerus and femur in the Indian there seems, therefore, to be nothing that would invalidate Pearson's formulæ; nevertheless the slightly greater proportionate length of the tibia in the Indian, as compared with the European, might possibly cause a slight underestimation of the stature as derived from the humerus and femur by these formulæ. Selecting long bones of one of the average-sized Roebuck females, the oblique length of the right femur is 417 mm., right tibia excluding spine, 355 mm., tibio-femoral index 85. In order that the tibio-femoral index should be 82 and so correspond with the average European, this tibia should only measure 341 mm. There is an excess length, therefore, in the tibia of this Indian woman of 14 mm., as compared with a European woman of similar femoral length. What degree of underestimation of the stature this might cause cannot be said, though it should not be very great. Taking the table for the reconstruction of the stature of the Roebuck people by means of Pearson's formulæ and eliminating the stature as derived from the tibiæ, the stature derived from the femur seems to be the most probable. Disregarding the possible effect of the long tibia we find the stature as follows:

	Cm.
Roebuck men	168·7
Roebuck women	156·2

The sexual ratio is 1·080, which is similar to the sexual ratio in modern Europeans—about 1·080.[2]

This stature is surprisingly similar to the stature of the modern Iroquois of Tonawanda reserve, a people who are at the present day probably the best representatives of the ancient Iroquois.

Statistics for modern Iroquois stature are as follows:[3]

—	No.	Stature in cm. (male)	No.	Stature in cm. (female)
Six Nations reserve, Brant co., Ont.	185	Max 192 Mean $170{\cdot}45 \pm 0{\cdot}3$ $\sigma = 602 \pm 0{\cdot}21$ Min. 157	118	Max. 171 Mean $157{\cdot}08 \pm 0{\cdot}3$ $\sigma = 4{\cdot}98 \pm 0{\cdot}22$ Min. 144
Tonawanda reserve, New York state	32	Max. 182 Mean $168{\cdot}79 \pm 0{\cdot}65$ $\sigma = 5{\cdot}42 \pm 0{\cdot}46$ Min. 157	31	Max. 167 Mean $155{\cdot}87 \pm 0{\cdot}52$ $\sigma = 4{\cdot}26 \pm 0{\cdot}37$ Min. 148

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[1] Ibid., p. 61.

[2] Phil. Trans., vol. 192, pt. A, 1899, p. 242.

[3] From the measurements on a series of adults of from 20 to 59 years of age, taken when on field work for the Geological Survey in 1911 and 1915. In all cases individuals, men and women, were measured in their stockinged feet.

Since the Tonawanda Iroquois, as will be shown later (page 41) are in the characteristic measurements of the width of the nose and face of purer Indian blood than are the Six Nations Iroquois, then it would seem probable that they should in stature also approximate more closely to the ancient Iroquois. At the time of the destruction of the Iroquoian tribes of Ontario by the New York Iroquois, large numbers of the Ontario Iroquois were adopted among the villages of their conquerors; therefore, so far as the Indian element goes, the Tonawanda Senecas probably present a generalized Iroquoian stature, any differences in stature among the Iroquoian peoples, if indeed there were any, having been merged after 1650.

The question, however, still remains unanswered so far as this paper is concerned—and a very interesting one it is in the present connexion—namely, whether the Roebuck and Middleport statures represent the general Iroquoian stature for Ontario and New York state, or whether there were noticeable differences in average stature among the different tribes in pre-European times? This question can only be answered by fuller data from pre-European long bones of the Hurons and from those of the pre-European Iroquois of New York state. Some of the observations of early writers record differences in stature among the Iroquoian tribes; from others one would infer that all the tribes were pretty much alike as regards stature. Upon the whole it seems probable that the latter view was probably correct. So far as this present research goes it would evidently be impossible to make any positive statements, as there are no data available from New York state.

In support of the correctness of the stature of the Roebuck people as estimated by Professor Pearson's formulæ from the measurements of their femora, there are the following considerations.

(1) The close correspondence between the stature of the Tonawanda Iroquois and the stature of the Roebuck Iroquois as derived from Pearson's formulæ.

	Av. stature in cm.
Tonawanda men	168·79
Roebuck men	168·7
Tonawanda women	155·87
Roebuck women	156·2

(2) Dr. Hrdlicka's estimation of the Delaware stature, with the close correspondence between the stature and average length of the long bones of the Delaware women and those of the Roebuck Iroquois women.

(3) The statement by Johannes Megapolensis[1] that the Mohawks were of similar stature to the Dutch when connected with the striking similarity between the stature of the Tonawanda men and the stature of Dutch conscripts given by Dr. Deniker.[2]

These considerations form a very plausible case. There is needed, however, more information as to the comparison in length between the long bones of the Ontario and New York Iroquois, and statistics for the lengths of modern British long bones would be of much assistance.

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[1] Short account of the Mohawk Indians by Rev. Johannes Megapolensis, jun., 1644. *See* extract given in the historical quotations on p. 31.

[2] *See* p. 29.

If it is correct that the Roebuck and Middleport peoples were similar in stature to the Iroquois in general, and that their stature was similar to that of the modern Tonawanda Senecas, then the ancient Iroquois were a people of a stature above the average, as tall as the modern Dutch but not quite as tall as the modern British. The superior stature of the Six Nations Indians would in this case be an indication that the introduction of European blood is tending to raise the stature slightly among the modern Iroquois. When taking measurements in Six Nations reserve it was the custom of the writer to ask the name of the tribe of the father and mother of the person measured. Occasionally the information was given that the father—or sometimes the mother—had been white, or that among the ancestry of either the father or mother there had been a white. Sometimes all that was known was that he or she had been a "white"; more often they knew the nationality.

This information may be tabulated as follows:

Number of Cases in Which the Various Nationalities were Mentioned

Nationality	Father	Mother	Ancestor on father's side	Ancestor on mother's side
British		1		2
English	4		1	2
Scotch	1			1
Irish	1		1	
French	1	1	8	2
German			3	
Dutch			1	1
"White" (nationality unknown)	3	3	1	3

The above figures are simply the result of chance information. They show the number of European races who enter into the composition of the modern Iroquois; possibly they show something of the proportions of these European races as they have affected the Iroquois. In early times it is probable that French and Dutch had most effect upon the Iroquoian physical type; in modern times the influence of the British peoples has probably predominated. At the present day the Six Nations reserve is surrounded by a population of British descent.

With regard to the stature of the European races who have influenced the Iroquoian physical type, the following figures are from Deniker, J., *Races of Man:*

		Stature of men in metres
1,304	Scotch in general	1·746
346	Irish	1·725
8,585	Inhabitants of United Kingdom of Great Britain and Ireland	1·719
315,620	Citizens of the United States born in the country	1·719
6,194	English in general	1·712
21,645	Canadian soldiers (chiefly descendants of the French)	1·703
741	Welsh	1·695
89,021	German emigrants to the United States	1·693
9,345	Dutch (conscripts)	1·685
447,172	French in general (conscripts)	1·646

Therefore, with the exception of the French, Europeans who have affected the physical type of the Iroquois have all been either of high stature or stature above the average. Any diminution in stature caused by the introduction of French blood would have probably been counterbalanced by the high statures of the British people. In later times the British influence has been predominant.

Appended are various extracts from the writings of early travellers, and missionaries, that relate to the stature of the Iroquois. These observations are of interest and value in that they record the impressions of people who saw the Iroquois at a time when they were as yet uninfluenced in physique by the Europeans.

HURONS

Champlain writes from his impressions after a winter spent in the Huron country in 1616: "Ils sont bien proportionée de leur corps, y ayant des hommes bien formez, forts et robustes, comme aussi des femmes, et filles . . . . . . et se trouve parmy ces nations de puissantes femmes, et de hauteur extraordinaire:"[1]

In 1632 Father Le Jeune writes—(as translated) "I saw the Hurons arrive in their 50 canoes and more. They made a very fine sight upon the river. They are large, well-made men . . . . . ."[2]

Later on in the same letter he gives another description of this same war party. "I saw three days ago near the great river St. Lawrence, five or six hundred Hurons in their savage costumes,—some in bear skins, others in beaver, and others in elk skins, all well-made men of splendid figures, tall, powerful, good-natured, and able-bodied . . ."[3]

In 1639 Father François du Peron writes from the Residence of the Conception (Ossossane) in the Huron country (as translated): "They are robust and all are much taller than the French."[4]

In the eighteenth century Peter Kalm writes his observations on the members of a delegation from the Hurons, Mohawks, and Micmacs. "The Hurons . . . are tall, robust people, well shaped, and of a copper colour. They have short black hair, which is shaved on the forehead from one ear to the other. . . The Anies[5] . . . are as tall as the Hurons whose language they speak. The Hurons seem to have a longer, and the Anies a rounder face. The Anies have something cruel in their looks."[6]

NEUTRALS

Of the physical characteristics of the Neutrals the writer can find only one description—that of Father Jerome Lalemant, written in 1641 (as translated). "There are some things in which they seem a little different from our Hurons. First, they appear taller, stronger, and better proportioned."[7]

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[1] Voyages et Descouvertures Faites en La Nouvelle France depuis l'année 1615 jusques a la fin de l'année 1618, par le Sieur de Champlain. Seconde edition, Paris, 1627.

[2] The Jesuit Relations and Allied Documents, edited by Reuben Gold Thwaites, Cleveland, 1897, vol. 5, p. 71.

[3] Jes. Rel., vol. 6, p. 25.

[4] Jes. Rel., vol. 15, p. 155.

[5] Mohawks.

[6] Travels into North America, by Peter Kalm. Translated into English by John Reinold Forster, F.A.S., 2nd edition, London, 1772, p. 320.

[7] The Jesuit Relations and Allied Documents, edited by Reuben Gold Thwaites, Cleveland, 1897, vol. 21, p. 199.

IROQUOIS OF THE STATE OF NEW YORK

In the letters of the Jesuit Fathers the Iroquois of New York state are constantly referred to as being tall, well-made men.[1]

Father Nau in the earlier part of the eighteenth century describes the Iroquois in the following terms (as translated): "Generally speaking you could find nowhere finer looking men. The savages are of better build than the French, but side by side with the Iroquois other savages seem dwarfed. Nearly all the men of our mission are nearer six feet in height than five."[2]

In 1644 the Rev. Johannes Megapolensis, jun., writes in a short account of the Mohawk Indians: "The people and Indians here in this country are like us Dutchmen in body and stature."[3]

In 1698 L. Hennepin writes of the Senecas: "These savages are for the most part tall, and very well shap'd. . ."[4]

In 1794 G. H. Loskiel describes the Delawares and Iroquois as follows: "The Delawares and Iroquois, and the nations in league with them, resemble each other much, both as to their bodily and mental qualifications. The men are mostly slender, middle-sized, handsome and strait. . . The women are short, not so handsome, and rather clumsier in appearance than the men. . . Their eyes are large and black, and as savages, the men have a very fierce and dreadful countenance. Their features are regular and not disagreeable, but the cheek-bones are rather prominent, especially in the women. Both have very white teeth. . ."[5]

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[1] Jes. Rel., vol. 21, pp. 243, 253; vol. 22, p. 277; vol. 30, pp. 261, 287.

[2] Jes. Rel., vol. 68, p. 263.

[3] Narratives of New Netherland 1619-1664, by J. Franklin Jameson, Ph.D., LL.D., New York, 1909, p. 168.

[4] A new Discovery of a Vast Country in America . . . by L. Hennepin, London, 1698, p. 54.

[5] History of the Mission of the United Brethren among the Indians in North America, by George Henry Loskiel. Translated from the German by Christian Ignatius La Trobe, London, 1794, vol. I, p. 12.

CHAPTER VII

ONTARIO IROQUOIAN CRANIAL TYPES

The prehistoric Iroquois of Ontario seem to have been composed of a dolichocephalic people mixed with a certain proportion of brachycephalic types; the brachycephalic element varied in amount among the different tribes and probably varied also at different periods of time. Definitely brachycephalic crania seem to occur rarely, whereas dolichocephalic crania are plentiful.

Below is appended a table showing the distribution of the cephalic indices in the crania from the Huron and (?) Huron ossuaries already referred to on page 15. In addition to these are included here some crania, in the collection of the Toronto Provincial Museum, from an ossuary[1] in Nottawasaga township, Simcoe county. It is probable that this ossuary was the burial site of a tribe of the Tobacco nation. For comparison with the data from the Huron ossuaries the means of some of the measurements and indices of the Nottawasaga crania are added *(See* table, page 33).

NEUTRAL

The writer has measurements of a number of crania that were obtained from ossuaries and single graves in the former Neutral territory. In accordance with archæological information kindly supplied by Mr. W. J. Wintemberg, the Ontario Neutral crania have been divided into three groups: (1) pre-European, (2) of doubtful age, (3) post-European. To these has been added a fourth group of three series of crania from the eastern Neutral territory—one from a burial site at Port Colborne, one from graves on Grand island, and the third from an ossuary at Orangeport, New York. These have been placed in a separate group because they show an interesting similarity to one another and also to a series of crania from New York state measured by Dr. Hrdlicka.

(1) Crania from Ossuaries of pre-European Age

Ossuary at Middleport, Brant county *(See* page 14).
" Beverly township,[2] Wentworth county.
" Clinton township,[3] Lincoln county.

These are all, almost certainly, Neutral.

The distribution of the cephalic indices of the Middleport ossuary crania is as follows:[4]

Among 8 male crania: 3 dolichocephalic with a cephalic index of 74; 1 brachycephalic with a cephalic index of 81.

Among 14 female crania: 2 dolichocephalic (lowest cephalic index 73); 1 brachycephalic with a cephalic index of 82; 4 with a cephalic index of 79.

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[1] Ont. Arch. Rept., 1886, p. 12; 1889, pp. 8, 10-11, 12, 44.

[2] Can. Jour., old series, vol. 3, p. 156; Ont. Arch. Rept. 1896-7, p. 46.

[3] Ont. Arch. Rept. 1901, p. 22.

[4] In this, as in the following groups, the writer is considering simply the definitely dolichocephalic and definitely brachycephalic crania. The rest were, of course, mesaticephalic.

Cephalic Index

Cephalic index	Male						Female					
	Tobacco	Huron		(?) Huron			Tobacco	Huron		(?) Huron		
	Nottawasaga tp.	Innisfil tp.	Flos tp.	Vaughan tp.	Markham tp.	Manvers tp.	Nottawasaga tp.	Innisfil tp.	Flos tp.	Vaughan tp.	Markham tp.	Manvers tp.
Dolichocephalic–												
68				2								
69						1						
70	1	1		3		1	1				1	
71		1	1	2		1						
72				5	1	1				2		
73				3			1					1
74		1		2		3		1		1		1
Mesaticephalic—												
75	1	3		3		1				1	1	2
76		2		2	1	1				2	1	2
77		1		1	1	4	1	1				2
78		1	1	1		1		1		5	1	
79				2		1				1		
80					1	2				1		1
Brachycephalic–												
81						1				1		
82												
83						1		1				1
84		1										
Total	2	11	2	26	4	19	3	4		14	4	10
Mean	72·5	75·55	74·5	73·27	76·25	76	73·33	78		76·79	74·75	76·6

Mean Indices of the Five Nottawasaga Ossuary Crania

Ossuary	No.	Cephalic index	No.	Vertical index	No.	Upper facial index	No.	Nasal index	No.	Bizygomatic width	No.	Nasal height	No.	Nasal width
Male														
Nottawasaga tp., Simcoe co.	2	72·5	2	70·5	......	......	......	......	......	......	......	......	......	......
Female														
	3	73·33	3	75·67	1	54	3	49	1	130	3	51·67	3	25·35

From the Beverly ossuary there are 5 male crania, all mesaticephalic, and 3 female crania, 2 of which are dolichocephalic (lowest index 68), and 1 mesaticephalic.

From the Clinton ossuary there is one male cranium with an index of 80; the rest are mesaticephalic.

These last two ossuaries, therefore, agree with the Middleport ossuary in the large proportion of mesaticephalic crania.

Data from another pre-European site in Neutral territory have been obtained, but as they do not agree with the others as regards the cephalic indices of the male crania they are being considered separately. This village site is at Clearville,[1] Orford township, Kent county; it is characterized by single grave burials accompanied by a small ossuary; and archæologically it is similar to other Neutral sites in that region.

There are four male crania available and they are definitely dolichocephalic, with indices of 72, 73, 74, and 75. The four female crania from this site are, on the whole, of broader head form. One is dolichocephalic with an index of 74, two are mesaticephalic, and one brachycephalic with an index of 82.

The female crania, therefore, in their mean cephalic index agree with the crania from the pre-European ossuaries in Brant, Wentworth, and Lincoln counties, but the male crania differ. It is quite possible that the southwestern Neutral tribes may have differed physically from the more central and middle-eastern Neutral tribes. Differences in physical type may well have occurred in a nation occupying such a large extent of territory and formed of a confederation of tribes. More information is needed as to the physical characters of the western Neutral tribes. In their cephalic index the men of the Clearville site resemble rather the New York Iroquois and Hurons. The cranial type of the male Clearville crania is a very striking one; the same type occurs in other parts of Ontario *(See* page 43).

Unusual divergences (such as appear here) between the mean cephalic indices of male and female crania from the same site occur also in the crania from the Beverly and Vaughan ossuaries. A possible explanation may be intermarriage with neighbouring tribes differing in physical characters. In the case of the Clearville villages some of the women may have been members of the more central and mesaticephalic tribes of the Neutral nation.

(2) Crania from Ossuaries of Doubtful Age

Data have been obtained from three ossuaries of doubtful age in Humberstone township, Welland county;[2] and from one in Wentworth county near Jerseyville. These ossuaries are probably Neutral, but the uncertainty as to their age makes their identification less certain than in the case of the first group.

Ossuary in Humberstone Township.[3] Among 4 male crania: 1 is dolichocephalic with a cephalic index of 68; 1 is brachycephalic with a cephalic index of 81.

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[1] Ont. Arch. Rept. 1889, p. 17.

[2] Ont. Arch. Rept. 1886, p. 11; ibid., 1889, p. 9.

[3] Crania in the collection of the Provincial Museum, Toronto.

Of 2 female crania: 1 is mesaticephalic with a cephalic index of 77, the other brachycephalic with a cephalic index of 81.

Ossuary in Humberstone Township.[1] Among 4 male crania: 1 is dolichocephalic with a cephalic index of 71; 1 brachycephalic with a cephalic index of 82.

Of 2 female crania: 1 is dolichocephalic with a cephalic index of 72; 1 mesaticephalic with a cephalic index of 79.

Ossuary at Sherks, Humberstone Township.[2] Among 4 male crania: 3 are dolichocephalic (lowest cephalic index 72).

Of 2 female crania: 1 is dolichocephalic with a cephalic index of 74; 1 is brachycephalic with a cephalic index of 81.

Ossuary near Jerseyville, Wentworth County.[3] 1 male cranium, dolichocephalic, with index of 71.

The crania of this group taken generally suggest a greater dolichocephalic element than in the first definitely pre-European group of ossuaries from Brant, Wentworth, and Lincoln counties.

Taking into consideration group (4), to be discussed later, it seems not unlikely that the eastern Neutral tribes may have been affected in physical type by proximity to the New York Iroquois, and have been a mixture between the more central mesaticephalic Neutral type and the dolichocephalic type of the New York Iroquois. It may be that it was a question of time-period and that the dolichocephalic element was a later introduction—seeing that two of the three series in group (4) are early post-European. However, at whatever time it may have occurred, this part of the Neutral territory seems to be a meeting ground of the mesaticephalic and dolichocephalic types.

(3) Crania from post-European Sites, Probably Seneca, in the Neutral Territory

Mr. W. J. Wintemberg is of the opinion, and is certain that he will some day have sufficient data accumulated to prove, that certain post-European sites—characterized by ossuaries accompanied by single graves—in the Neutral territory are the remains of villages of some of the Senecas who settled there after the destruction of the Neutral nation in 1651 by the New York Iroquois.

Two male crania in the collection of the Provincial Museum at Toronto, which were obtained from graves on sites of this class, one on the Sealey farm, Brantford township, Brant county, the other on the Walker farm, Onondaga township, Brant county, both have a cephalic index of 75.

As the Senecas probably were dolichocephalic, crania from post-European Seneca sites in the Neutral territory may be expected to be, on the whole, dolichocephalic; yet owing to the inclusion of captives of the Neutral tribes, they probably vary considerably in head form.

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[1] Crania in the collection of the Buffalo Society of Natural Sciences.

[2] Crania in the collection of the Buffalo Society of Natural Sciences and in the collection of the Anthropological Division of the Geological Survey, Ottawa.

[3] Cranium in the collection of the Provincial Museum, Toronto.

The type of the cranium from the Sealey farm site, with its heavy brow ridges and sloping forehead, is a very striking one and resembles in some particulars a type of cranium that occurs here and there among the Ontario Iroquois *(See* page 43).

(4) Crania, Probably Neutral, in the Eastern Neutral Territory

Port Colborne, Welland County.[1] On a sandhill at this place there was found a large ossuary and a number of single graves. Both are of post-European date. Mr. W. J. Wintemberg suggests that the ossuary and graves may not be coeval. The writer has measurements from seven crania from this burial ground, in the collection of the Provincial Museum, Toronto. Two are defective. Of the remaining 5 there are three male with cephalic indices of 71, 74, and 76; and 2 female with cephalic indices of 73 and 79. Three out of these 5 crania are, therefore, definitely dolichocephalic.

Perhaps the inhabitants of the Neutral village at Port Colborne differed somewhat in their diet from those of other Iroquoian villages from which data has been obtained, owing to local conditions. In one of the male crania the teeth are worn obliquely.[2] It has been suggested that obliquely worn teeth may be due to a diet of shellfish and the consequent crunching of hard bits of shell. This is very interesting in view of the location of this village near the lake shore.

The other burial ground of this class is on Grand island, and consists of single graves. The writer has measurements of six crania from these graves, in the collection of the Buffalo Society of Natural Sciences. Mr. W. L. Bryant informs the writer that he assisted in the excavation of the cemetery; that it was an early post-European site, almost certainly Neutral; that the articles found were some typical Neutral pottery, pipes, bone combs, shell beads, and a few triangular flints; that the European articles included Jesuit rings, brass points, iron awls, axes, and brass kettles.

Of the 4 male crania, 2 are dolichocephalic with indices of 68·7 and 71; the other two mesaticephalic with indices of 75 and 78.

There are also two female crania, both dolichocephalic, with indices of 68 and 71·7.

The crania from this site, therefore, agree with those from the Port Colborne site with respect to the preponderance of dolichocephalic types. Taking into consideration Dr. Hrdlicka's[3] figures for the cephalic indices of the crania from New York state it, therefore, seems probable that the eastern Neutral tribes were affected physically by their proximity to the New York Iroquois, for the inhabitants of these two sites agree with the New York Iroquois in being upon the whole dolichocephalic, and in this respect they differ from the inhabitants of most of the other Neutral sites from which data have been obtained. Below, Dr. Hrdlicka's figures for his measurements of a series of New York crania are given as they are interesting to compare with the measurements and indices of Ontario Iroquoian crania.

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[1] W. J. Wintemberg: unpublished notes.

[2] Obliquely worn teeth are found among Eskimo crania (Geol. Surv., Canada, Mus. Bull. No. 9).

[3] Hrdlicka, A.: Physical Anthropology of the Lenapes or Delawares; Smith. Inst., Bur. Am. Ethn., Bull. 62.

Site	No.	Cephalic index	No.	Vertical index	No.	Upper facial index	No.	Nasal index[1]	No.	Bizygomatic width	No.	Nasal height[1]	No.	Nasal width
							Male							
Port Colborne	3	73·67	3	74	2	52	3	49·33	2	139·5	3	54	3	26·5
Grand Island	4	73·25	4	73·2	3	51·9	4	53	3	139·3	4	53	4	28
Orangeport	6	72·67	6	75·83	......	*?*	1	49·04	......	*?*	1	52	1	25·5
							Female							
Port Colborne	2	76	2	75	......	*?*	1	47	1	134	1	50	1	23·5
Grand Island	2	70	2	72·2	2	53·2	2	57·4	2	132·5	2	48	2	27·5
Orangeport	5	75·6	5	74·4	......	*o*	4	55·25	1	132	4	48	4	26·5

[1] Nasal height measured from nasion to akanthion.

Crania from New York State

—	No. of crania (male)	Mean	No. of crania (female)	Mean
Cephalic index	19	73·5	15	74·8
Upper facial index	10	51·7	11	52·9
Nasal index[1]	15	51·8	13	53·2
Bizygomatic width	10	140·5	11	131
Upper facial height	10	74	11	69
Nasal height[1]	15	53	13	50
Nasal width	15	27·5	13	26·7

[1] Nasal height measured from nasion to subnasal point.

The third series of Eastern Neutral crania comes from an ossuary at Orangeport, New York.

Of the 6 female crania, 5 are dolichocephalic (highest index 74, lowest index 68); the sixth is almost brachycephalic, having an index of 79.

Of the 5 male crania, 2 are dolichocephalic, both having indices of 73; 2 are mesaticephalic, with indices of 76; and the fifth is practically brachycephalic, having an index of 80.

The table on page 38 compares these three series with respect to some of the cranial and facial indices and measurements.

Not only in the cephalic index do these three series agree rather with crania from New York state than with those of the more central Neutral sites, but also in the nasal measurements and indices.

The following table gives the mean cephalic indices of the four groups of crania from the former Neutral territory.

(1) Pre-European

(a) Ossuaries almost Certainly Neutral

—	Male		Female	
	No.	Mean cephalic index	No.	Mean cephalic index
Middleport, Brant co.	8	77	14	77·43
Beverly tp., Wentworth co.	5	77·2	3	71·67
Clinton tp., Lincoln co.	1	80	....	....
(b) Single Graves Accompanied by Small Ossuary				
Clearville, Orford tp., Kent co.	4	73·5	4	78·25
(2) Ossuaries of Doubtful Age, Probably Neutral				
Near Jerseyville, Wentworth co.	1	71	....	....
Humberstone tp., Welland co.[1]	4	76	2	79
Humberstone tp., Welland co.[2]	4	77·75	2	75·5
Sherks, Humberstone tp., Welland co.	4	74	2	77·5

[1] Crania in the collection of the Provincial Museum, Toronto.

[2] Crania in the collection of the Buffalo Society of Natural Sciences.

(3) Post-European (Probably Seneca) Ossuaries with Single Grave Burials

—	Male		Female	
	No.	Mean cephalic index	No.	Mean cephalic index
Sealey farm, Brant co	1	75	....	....
Walker farm, Brant co	1	75	....	....

(4) Eastern Neutral Territory

	Male No.	Male Mean cephalic index	Female No.	Female Mean cephalic index
Port Colborne, Welland co	3	73·67	2	76
Grand island	4	73·25	2	70
Orangeport, New York	6	72·67	5	75·6

If, as seems probable, the western New York Iroquois type of head was, in the main, dolichocephalic, and that of the central Neutral tribes mesaticephalic, then with the intermingling of the two types of head form after 1651 it is probable that the Seneca head form became broader, at first simply by the adoption among their villages of broad-headed Neutrals, later as the result of intermarriage with them.

In this connexion the series of Seneca crania[1] from an old, but post-European Seneca cemetery in Buffalo is of great interest. The mean cephalic index of 6 male crania is 75·67, of 2 female crania, 76·5. This suggests that a change[2] to a broader head form had already begun to take place among the Senecas at that date.

The type of some of these crania is very interesting also, recalling as it does a pre-European type of cranium found in the Neutral territory *(See* page 37); so that this also suggests the influence of Neutral captives upon the physical type of their conquerors. This is only put forward as a plausible suggestion, as the writer has no knowledge as to the prehistoric Seneca types. At that time, too, no doubt intermixture with mesaticephalic and brachycephalic Europeans was beginning to take place, and this together with Neutral intermixture may have produced the modern mesaticephalic Seneca head form.

The modern Iroquois are a people formed of a number of elements. First, and as a foundation, there are the Five Nations, the Mohawk, Onondaga, Oneida, Cayuga, and Seneca, who formed about the year 1570 the famous League of the Iroquois. These nations formerly inhabited central New York from the Lake of the Senecas on the west to the junction of the Mohawk and Hudson rivers on the east. In 1712 a sixth nation—that of the Tuscaroras of Carolina—joined the League. In 1742[3] their dependants and tributaries comprised the following tribes: the Mohicans (of Hudson river and New England); the Delawares; the Shawnees (of the west branch of the Susquehanna and Ohio); the Conestoga Indians (mostly destroyed, but a few adopted by the Oneidas); the Nanticokes (of the eastern shore of Maryland); the Tutelu (of Virginia). Many members of these dependant tribes were no doubt adopted among the villages of the Six Nations. Several of the Iroquois of Six Nations reserve (Ontario) who were measured traced back their descent to Nanticoke and Tutelu ancestors. At the present day a small part of this reserve is occupied by a band of Delaware and Mississauga Indians, and there is some intermarriage between them and the Six Nations Iroquois. When in 1648-1651 the Iroquois of New York state conquered and broke up the Iroquoian tribes of Ontario, great numbers of these tribes also were adopted among the villages of their conquerors. In 1653 Father Le Moine found more than 1,000 Christian Hurons among the Onondagas. Captives of the Neutral nation were incorporated in large numbers among the Iroquois, chiefly in the villages of the Senecas. Numbers of extracts from the writings of the Jesuit missionaries might be adduced to illustrate the Iroquoian method of keeping up their numbers and repairing the wastage of war by the wholesale adoption of captured enemies.[1] It is very evident that, so far as the Indian element itself was concerned, the Iroquois became in course of time an extremely mixed people.

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[1] In the collection of the Buffalo Society of Natural Sciences. Some of the crania in the series from this cemetery are those of Europeans, some may be those of mixed-bloods: only the undoubtedly Indian crania have been included in the above series. Mr. W. L. Bryant informs the writer that this cemetery was begun by the Senecas about 1780 and was subsequently used by the neighbouring whites until 1890.

[2] Always provided that it is correct to assume that the Senecas were originally definitely dolichocephalic.

[3] A treaty was made with the Indians of the Six Nations at Philadelphia in July 1742.

With the arrival of the whites and the subsequent colonization by them of eastern America in the early part of the Seventeenth century, intermixture began to take place between the Iroquois and the Europeans. The European nationalities principally affecting the Iroquois in this way have been the British, French, Dutch, and German. The Iroquois are, therefore, a people comprised of mixed eastern Indian elements combined with mixed European elements. Negro intermixture, although it has in certain cases taken place among the Six Nations Iroquois, has been so slight as to be practically negligible. A very few individuals of mixed Negro-Indian descent were measured, but their measurements are not included in the statistics given.

In connexion with the cephalic indices of the ancient Iroquois, some statistics as to the cephalic index of the modern Iroquois may be of interest. Measurements were taken by the writer in 1912 and 1915 among the Iroquois of Six Nations reserve, Brant county, Ontario, and the Senecas of Tonawanda reserve, New York state. The Tonawanda Senecas are comparatively few in number (500 in 1915), but they are at the present day the purest blood Iroquois extant. Six Nations reserve is a large reserve; the population in 1911 was 4,466.

That the Tonawanda Iroquois are less affected by intermixture with the whites than are the Six Nations people is shown by the characteristic facial measurements of the bizygomatic width and nasal width.

Bizygomatic Width

—	Male			Female		
	No.	Mean	σ	No.	Mean	σ
Six Nations..................	245	144·63±0·23	5·41±0·17	163	135·66±0·27	5·18±0·19
Tonawanda..................	39	144·87±0·6	5·54±0·42	43	138·05±0·49	4·71±0·34

Nasal Width

Six Nations..................	244	40·79±0·15	3·36±0·1	162	36·13±0·15	2·93±0·11
Tonawanda..................	38	41·24±0·35	3·17±0·24	43	37·81±0·24	2·37±0·17

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[1] *See* Jesuit Relations, vol. 49, p. 233; ibid., vol. 62, p. 71.

It will be noted, too, that the standard deviation in the Tonawanda series is, except in one instance, smaller than in the Six Nations series, even though the number of cases is so much greater in the latter.

The cephalic indices are as follows:

Cephalic Index

—	Male			Female		
	No.	Mean	σ	No.	Mean	σ
Six Nations	244	79·14±0·14	3·3 ±0·1	163	79·95±0·16	3·03±0·11
Tonawanda	39	79·59±0·43	3·96±0·03	43	79·42±0·37	3·63±0·26

It is noteworthy in the modern cephalic index series that the standard deviations are greater in the Tonawanda than in the Six Nations series, a reversal of what occurs in the case of the bizygomatic width and nasal width. Possibly it may be due to the fact that the cephalic index even in ancient times showed great variation, whereas the variation in bizygomatic and nasal width became greatly extended with the introduction of European blood, and is probably more marked in the statistics from Six Nations reserve than in those from Tonawanda on account of the greater European element in the former.

It is curious that in the Tonawanda series the mean cephalic index of the women is very slightly less than that of the men; this is the reverse of what usually occurs with regard to the cephalic index.

In the following table are the cephalic indices of four ancient Iroquoian groups, two units having been added to the mean cephalic indices of the ancient Iroquois in order to render them equivalent to the cephalic index on the living.

Cephalic Index of Three Ancient Iroquoian Groups

—	Male		Female	
	No.	Mean cephalic index	No.	Mean cephalic index
Roebuck	3	80	24	79·88
Middleport	8	79	14	79·43
Huron and (?) Huron	66	76·74	33	78·63
Huron	13	77·38	4	80

Comparing the two tables of prehistoric and modern cephalic indices it will be seen that there is no difference between the cephalic index of the modern Tonawanda and Six Nations Iroquois and that of the Roebuck and Middleport Iroquoian tribes. As compared, however, with the Hurons[1] and with the New York Iroquois—taking Hrdlicka's figures quoted on page 39, the Iroquoian head form has become considerably broader in modern times.

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[1] Excluding the female Huron crania on account of the small numbers.

ONTARIO IROQUOIAN CRANIAL TYPES

Among all groups of Ontario Iroquoian crania examined there is a great complexity of physical types. The greatest uniformity of type is shown by the male crania from Vaughan ossuary.

Two very different types of male crania have been noticed, for the reasons that they are so unlike one another; that they occur in crania from various ossuaries in Ontario; that they occur side by side in one ossuary—that in Humberstone township—and separately in the case of others. One is a very striking type, in that it is so "primitive" in some of its features. It is characterized by dolichocephalism; low, receding, and narrow forehead; large, outstanding, external angular processes; and heavy brow ridges. The best examples are a cranium obtained from an ossuary in Humberstone township, Welland county, with cephalic index 68·4; one from ossuary No. 3, near Jerseyville in Wentworth county, with cephalic index, 70·9; and one from the Clearville village site in Kent county, with cephalic index, 71·4.[1]

Among (?) Huron crania, those from Vaughan ossuary are somewhat of this type. Another, a non-adult, is among those from Markham ossuary (cephalic index 74·2).[2] In Manvers ossuary, too, there occurs a cranium rather of this type (cephalic index 74·3).[3] It does not occur, however, among the crania from the Middleport ossuary. On this account, and for the reason that the cranium from the post-European Sealey farm village site in Brant county[4] is somewhat of this type (cephalic index 75·14, combined with sloping forehead and huge brow ridges), the writer is inclined to the opinion that it was a New York Iroquoian rather than an Ontario Iroquoian type. As no knowledge has been obtained as to whether it is to be found among the crania of the prehistoric New York Iroquois, and seeing that the crania from Vaughan ossuary are rather of this type and that it occurs elsewhere among (?) Huron crania, it is, of course, quite possible that it is a general Iroquoian type and to be found among all the Iroquoian tribes.

The second type is best represented by two adult male crania from the Middleport ossuary.[5] Compared with the first type this second one had a broad head form (cephalic indices of the two Middleport crania, 81·1 and 79·8); the forehead is broad, low, but well arched; brow ridges may be either strongly or moderately marked. The face is rather short and wide, with strong cheek bones. This type has been noted as occurring in two of the crania from the Humberstone ossuary[6] (cephalic indices 80·5 and 77·8); in two crania from Beverly ossuary[7] (cephalic indices 77·9 and 76·7); in a cranium from Port Colborne ossuary[8] (cephalic index 79·41); and in several cases among the Indian crania from the post-European Seneca cemetery near Buffalo.[9]

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[1] The crania are now in the Royal Ontario Museum of Archæology, Toronto, but their catalogue numbers when they were in the possession of the old Provincial Museum of that city were, respectively, 12474, 12477, and 12500.

[2] Cat. No. 128, Royal Ontario Museum of Archæology, Toronto.

[3] Cat. No. 12606 of the old Provincial Museum, Toronto.

[4] Cat. No. 25477 of the old Provincial Museum, Toronto.

[5] Cat. Nos. XIII.F.60 and XIII.F.62, National Museum of Canada.

[6] Cat. Nos. 12467 and 12472 of the old Provincial Museum, Toronto.

[7] Cat. Nos. 12971 and 12953 of the old Provincial Museum, Toronto.

[8] Cat. No. 12486 of the old Provincial Museum, Toronto.

[9] In the collection of the Buffalo Society of Natural Sciences, Buffalo.

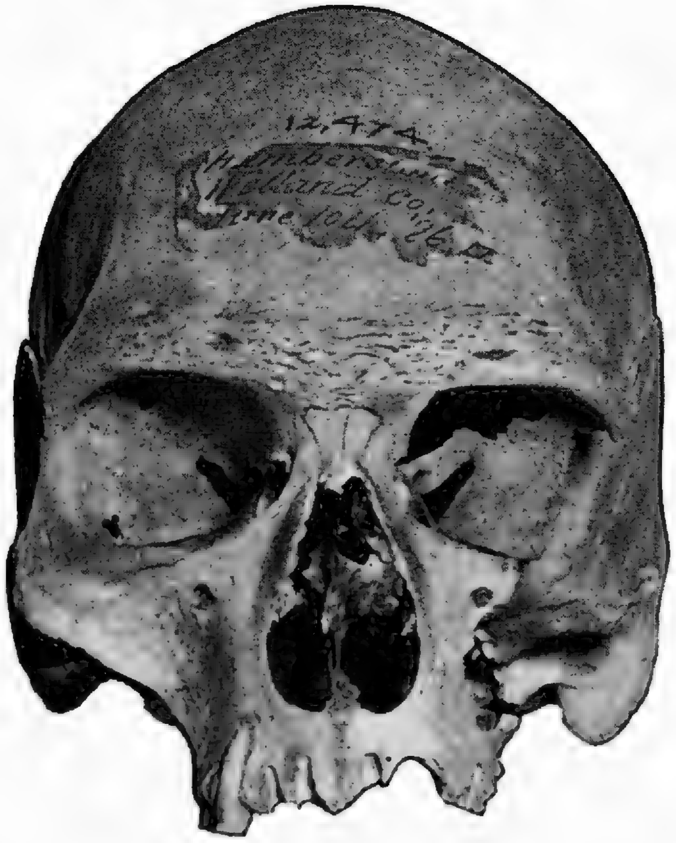

Figure 2 A. The long-headed "primitive" type of Iroquoian skull. (Photo by courtesy of the Royal Ontario Museum of Archæology, Toronto.)

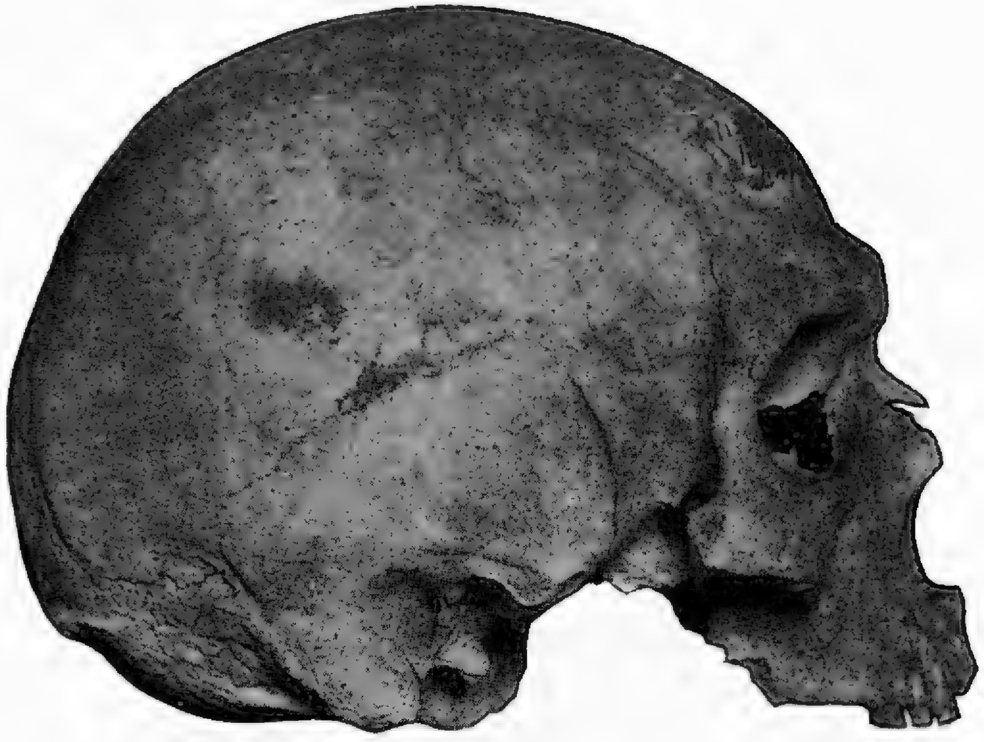

Figure 2 B. Side view of Figure 2 A. (Photo by courtesy of the Royal Ontario Museum of Archæology, Toronto.)

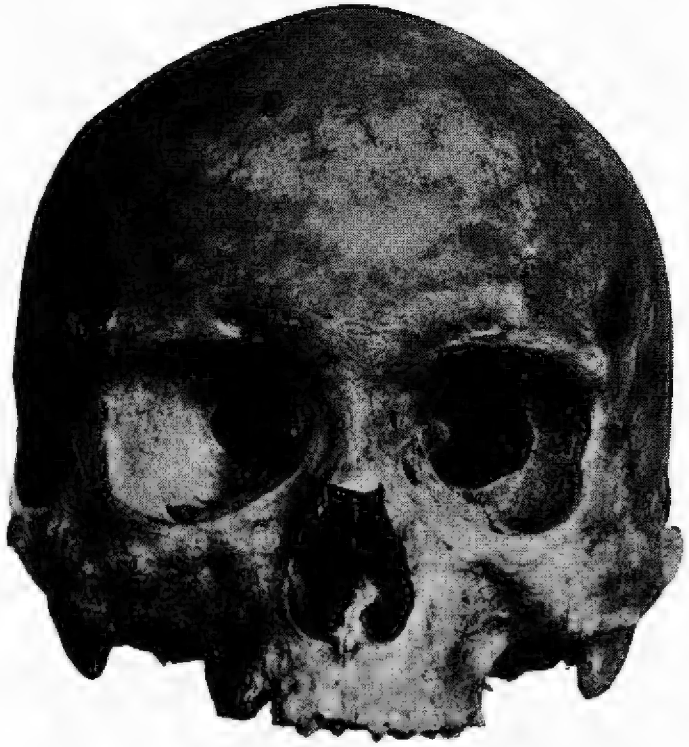

Figure 3 A. The broad-headed, broad-faced type of Iroquoian skull.

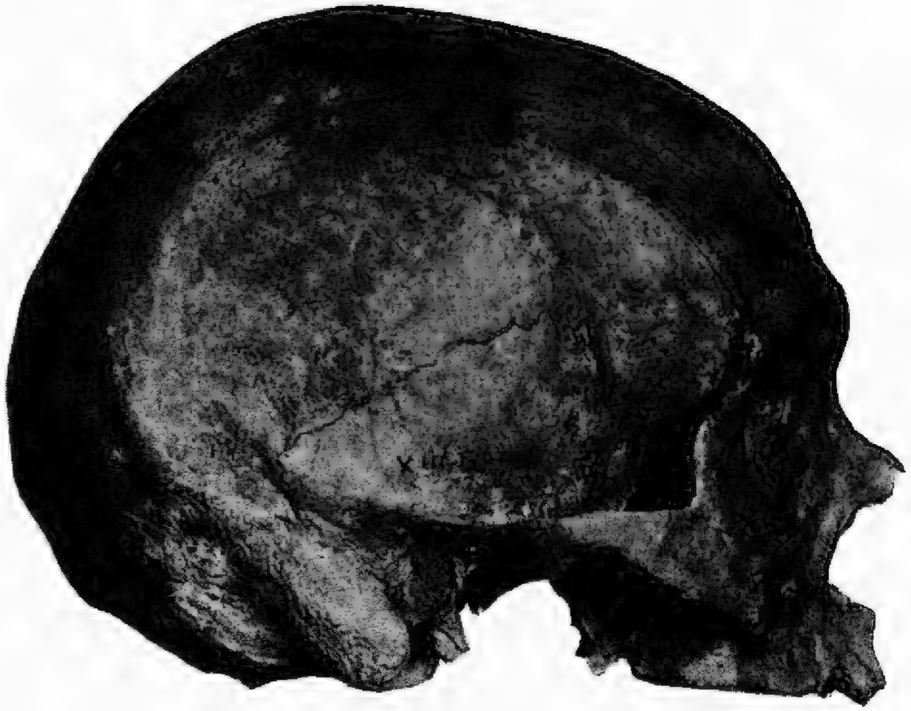

Figure 3 B. Side view of Figure 3 A.

Judging from its cephalic index and distribution, the writer would be inclined to consider this a Neutral type. As in the case of the other type, however, information is needed as to whether it does or does not occur among the prehistoric crania from New York state.

The contrast between these two types is shown in the following comparison between the means of some of their measurements and indices.

Type No. 1 comprises crania Cat. Nos. 12474, 12477, 12500.

Type No. 2 comprises crania Cat. Nos. XIII.F.60, XIII.F.62, 12467, 12472, 12951, 12953.

—	Glabello-occipital length	Maximum breadth	Basi-bregmatic height	Cephalic index	Vertical index	Minimum frontal diameter	Bizygomatic width	Upper facial height	Upper facial index	Nasal height[1]	Nasal width	Nasal index
Type 1...........	189·3	133	135·3	70·2	71·5	92	141·5 (2)	72	52 (2)	55·3	27·3	49·3
Type 2...........	186·3	146·8	140·5	79	75	99	145·4 (5)	69·5 (4)	47·5 (3)	53·5	27	50·5

Low, receding foreheads are quite common among Iroquoian crania. The male crania from Vaughan ossuary are noteworthy on account of the prevalence among them of this character. Heavy brow ridges are also to be found in the crania of these peoples. In the collection of the Provincial Museum, Toronto, the following Iroquoian crania have been noted as having exceptionally massive brow ridges:

No. 12475, adult cranium from ossuary in Nottawasaga tp., Simcoe co.
No. 31316, " " from ossuary in Innisfil tp., Simcoe co.
No. 12606, " " from ossuary in Manvers tp., Durham co.
No. 12472, " " from ossuary in Humberstone tp., Welland co.
No. 12549, " " from ossuary in Vaughan tp., York co.
No. 25477, " " from grave, Sealey farm village site, Brantford tp., Brant co.

These were crania having brow ridges that were really remarkable for their development. There are many other Iroquoian crania, too, that the writer has seen that are noteworthy in respect to this feature.

THE CONDITION OF THE BACK OF THE ORBITS IN CERTAIN CRANIA FROM IROQUOIAN OSSUARIES

With regard to crania from ossuaries there is a curious feature that is worth noting, viz., that in some few of them the back of the orbit or orbits has been cut out. The writer first noticed this in some crania that he collected from Middleport ossuary; then, later, when measuring the cranial collection in the Provincial Museum, Toronto, he remarked its occurrence in crania from various ossuaries, and took a note of each case at the time. Tabulated, these cases are as follows:

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[1] Nasion-akanthion.

Ossuary	Back of right orbit cut out	Back of left orbit cut out	Back of both orbits cut out	Age and sex of cranium in which this condition occurs
Nottawasaga tp., Simcoe co.	1	....	....	Adult female.
	....	1	....	Adult male.
Innisfil tp., Simcoe co.	....	4	....	All adult male.
Manvers tp., Durham co.	....	3	....	2 adult male, 1 adult female.
	....	....	1	Adult male.
Markham tp., York co.	....	....	1	Adult male.
Vaughan tp., York co.	3	....	....	All adult male.
Beverly tp., Wentworth co.	....	1	....	Adult male.
Humberstone tp., Welland co.	....	....	1	Adult male.
Middleport, Brant co.	....	....	3	All adult male.
	....	1	....	Adult female.
Fort St. Marie, Christian is.	2	....	....	Both adult, one, perhaps both, male.

Probably this cutting out was done at the time of the deposition of the bones in the ossuary. It may have had some religious or ceremonial significance. The writer has seen no crania from single graves treated in this way. It is curious that only a few skulls in each ossuary have been so treated. The table shows that there is no regularity in the orbit that has been selected, nor is it confined to crania of one sex, although it is true that the female crania treated in this way are very few in number. As it occurs in the crania that the writer took out himself from the Middleport ossuary, there is no doubt that the cutting out was done before or at the time of the formation of the ossuary.

CHAPTER VIII

TEETH OF ONTARIO INDIANS

There is one character in particular that links the Roebuck people with the Iroquoian tribes of Ontario and constitutes a sharp distinction between them and the tribes of the mounds at Rice lake. This is the condition of the teeth. Among the teeth of the Iroquoian tribes there is a high percentage of those showing caries in its various stages *(See* page 5). Teeth from the mounds, on the contrary, are surprisingly perfect. Out of 233 teeth from the skulls of adults, there were only three that were affected by caries. It is thought not unlikely that the difference in the condition of the teeth in these two peoples is due to a difference in diet. The Iroquoian tribes were settled and agricultural, and although they were keen hunters and fishermen as well as agriculturists yet corn may be considered as their main food. Corn was prepared in various ways, but most commonly in the form of broth or soup—the so-called sagamite. In the preparation of this dish the corn was pounded into meal and boiled in water; and to it was added, if possible, meat, fish, or oil, to give richness and flavour. Many other cookery receipts of the Iroquois turned out dishes of a soupy or mushy nature. The presence of so much starch in their food and the prevalence of meals requiring but little mastication possibly accounts for the amount of caries in the teeth of this people.

The sound condition of the teeth of the Rice Lake Indians points to a healthier diet—healthier, that is to say, with regard to the effect upon the teeth. It is possible that the difference is due to the differences in diet[1] between that of a settled agricultural people and that of a tribe of nomadic hunters, living mainly upon meat and fish, vegetable food being of secondary importance and used, when procurable, as a supplement to their meat diet. Among hunting tribes, in times of plenty meat and fish were dried for later use. Father Paul le Jeune, Jesuit missionary among the Montagnais in 1634, feelingly describes the dried meat as "dried hard as wood and dirty as the street".[2] A meat diet has a preservative effect upon the teeth, and it also demands a full exercise of the powers of the jaws and teeth.

In connexion with the sound state of the teeth from the Ontario mounds, the similar condition of the teeth from mounds in Manitoba is most interesting. Professor H. Montgomery, Ph.D., conducted excavations into some mounds at Sourisford, Manitoba, and in the course of this work collected a quantity of skeletal remains, now in the collection of the Royal Ontario Museum of Archæology, Toronto. The material was collected with great care and thoroughness, so that there is a good series of teeth available. The figures are as follows:

—	Sound	Affected by caries
Permanent fully erupted teeth	345	3
Temporary teeth	34	0

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[1] Possibly cooking methods may be also of importance.

[2] Jesuit Relations, vol. 8, p. 51.

These figures show how surprisingly perfect are the teeth from these Manitoba mounds; and they seem to indicate a similarity in diet between the Rice Lake and Sourisford tribes. There is great need of comparative data from the remains of the prehistoric northern Algonkian tribes of Ontario. The state of their teeth would probably either substantiate the foregoing theory as to the connexion between sound teeth and a hunting people's means of subsistence, or, on the other hand, might suggest that the very perfect teeth of these tribes of the mounds were due to some special conditions.

Teeth from the Algonkian Mounds at Otonabee, Ontario, Rice lake, and Hastings

—	Permanent teeth from adults		Permanent, fully erupt teeth from non-adults		Temporary, fully erupt teeth	
	Sound	Affected by caries	Sound	Affected by caries	Sound	Affected by caries
"Serpent" mound, Otonabee...	159	2	6	....	4	....
Mounds on north shore islands, Rice lake....................	8	1	....	....	....	....
Sugar Island mounds, Rice lake	5	....	....	....	....	....
Mound on Roach point, Rice lake..........................	7	....	....	....	....	....
Preston mound, near Hastings..	51	....	....	....	....	....
Totals.................	230	3	6	....	4	....

CHAPTER IX

GENERAL CONCLUSIONS

The Roebuck Iroquois prove to have been physically similar to the former inhabitants of the ancient Iroquoian village at Middleport in Brant county.

The Middleport village site, pre-European, Iroquoian, and in the territory of the ancient Neutrals, probably belonged to a tribe of the Neutral nation. This nation was composed of a confederation of Iroquoian tribes who in 1616, when they first became known to the French, occupied that part of southern Ontario immediately north of lake Erie and for some distance inland. Champlain in 1616 writes: "Il y a aussi à deux ou trois journées d'iceux une autre nation de Sauuages, qui font grand nombre de Petun, d'un costé tirant au Su, lesquels s'appellent la nation neutre, qui sont au nombre de quatre mil hommes de guerre, qui habitent vers l'Occident du lac des Entouhonorons de quatre-vingt à cent lieuës d'estenduë, lesquels neantmoins assistent les cheueux releuez contre les gens de feu: Mais entre les Yroquois, et les nostres, ils ont paix, et demeurent comme Neutres."[1] By the Hurons they were called "Attiwandaronk" meaning "they are those whose language is awry". In 1626 Daillon states that the Neutrals occupied 28 villages. In 1640 the Jesuit missionaries ascribed to them 40 villages with a population of 12,000 souls, of whom 4,000 were warriors. In 1650-51, having conquered the Huron and Tobacco nations, the Iroquois of New York state next attacked the Neutrals, and from that date the latter ceased to exist as an independent nation. Of the survivors some as fugitives joined the broken remnants of the Hurons and Tobaccos; others as captives were incorporated among the villages of their conquerors, chiefly among those of the Senecas.[2]

It is an interesting problem, therefore, as to how it comes about that an Iroquoian tribe differing in various details of culture yet similar in physical appearance to a Neutral tribe of Brant county was living so far north as Grenville county, and in a territory so remote from that of the Neutrals in the historic period.

With regard to sites pre-European, Iroquoian, and characterized by an ossuary mode of burial, in the Neutral territory, it has already been suggested that they may plausibly be assigned to the tribes of the Neutral nation.[3] Upon the evidence available, the people inhabiting these sites were, upon the whole, Iroquoian in physical characters, but with regard to those in the central regions differed slightly from the Iroquois of New York state (according to Dr. Hrdlicka's figures for New York crania), and also from the Hurons (according to the crania in the collection of the Provincial Museum, Toronto), in their tendency towards a broader type of head. For, to judge from the data at our disposal, the New York Iroquois were dolichocephalic and the Hurons upon the border line between dolichocephalism and mesaticephalism, with a tendency towards dolichocephalism; but the Neutrals (or at any rate the people of their central territory) were definitely mesaticephalic[1], with a tendency towards brachycephalism. In this respect the Middleport and Roebuck people agree, and in this respect they together differ from the Hurons and from the New York Iroquois.

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[1] The Works of Samuel de Champlain, vol. III, p. 99; The Champlain Society, Toronto, 1929.

[2] Cf. Article "Neutrals" in Handbook of the Indians of North Mexico; Bull. 30, Bur. of Am. Ethnology, Washington.

[3] That the Neutrals made use of an ossuary mode of burial is indicated by the description of Father Lalemant in 1641 (*See* Jes. Rel., vol. 21, p. 199).

The few crania of the Tobacco nation are upon the whole dolichocephalic, and so similar in this respect to the Huron crania. The two ossuaries definitely in Huron territory—those in Simcoe county—afford a series of 13 male crania with a cephalic index of 75·38.[2] The ossuary in Markham township, York county, shows perhaps little divergence physically from the Simcoe county ossuaries, the most noticeable character in this ossuary being the very sound state of the teeth. The writer has some doubts though as to the crania from Vaughan township, York county, and Manvers township, Durham county. Vaughan male crania are definitely dolichocephalic, and in this respect and in their general cranial type may perhaps agree rather with crania from New York state. Still it must be admitted that further Huron material may show that neither the cephalic index nor the cranial type of the ossuary is sufficient to separate it from the Huron group. At present though it must be considered doubtful. Crania from the ossuary in Durham county are rather mesaticephalic, male cephalic index 76. In this same ossuary the crania are narrower nosed than other series of Iroquoian crania. This is interesting in that this ossuary is, of the writer's series, the nearest to the Rice Lake district where there was at one time, prehistoric in point of date, tribes non-Iroquoian in culture and differing physically from the Iroquois in having narrower noses, shorter faces, and very perfect teeth. The Durham ossuary male crania have also a cephalic index similar to that of the Rice Lake men, but in the proportions of the face and in the prevalence of caries of the teeth the Durham crania are Iroquoian. Perhaps the higher cephalic index and the narrower noses of this people (Iroquoian[3] in their mode of burial as well as in some of their physical characteristics) indicate some intermixture with the Rice Lake tribes, or possibly intermixture with northern Algonkian tribes[4]—not necessarily the Rice Lake people—of narrower nose than that of the Iroquoian people. Possibly the northern Algonkian tribes may have had narrower noses than the Iroquoian, and with regard to this feature have influenced the physical type of the Ontario Iroquoian. Dr. Hrdlicka's figures suggest that the New York Iroquois were broader nosed than were the Ontario Iroquois; but as regards this it is necessary to have comparative data from northern Algonkian tribes and this has not been obtained.

Most probably these ossuaries belong to various periods of time, and most probably, also, Huron physical characters varied at different periods, being influenced by the Iroquoian and non-Iroquoian tribes with whom at different periods they may have come in contact. The Huron tribes, too, probably in earlier times occupied territories other than the one in which they were situated at the time that they became known to Europeans. Only with the collection of data from the remains of the pre-European Algonkian tribes of Ontario will it be known if there were physical differences between the two peoples.

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[1] The average cephalic index is here considered, for it is true that there were a few dolichocephalic examples among the Middleport crania as well as among those from Roebuck; but these form a very small proportion of the total number.

[2] If one of these crania with, for an Iroquoian cranium, the exceptionally high cephalic index of 84, be left out, the average cephalic index of the series of 12 Huron crania is 74·67.

[3] There is always the possibility of Algonkian tribes, neighbours of the Hurons, adopting an ossuary mode of burial.

[4] Perhaps the Rice Lake people do represent in physical type the northern Algonkian Indians.

Broadly speaking, Iroquoian remains from Ontario are alike in the average proportions of the nose and face, and in the caries of the teeth to which they were all subject; in these three characters they differ from the tribes of the Rice Lake mounds.

The very perfect state of the teeth from the Rice Lake mounds and their strong contrast in this respect with Iroquoian teeth, is due, it is thought, to differences in diet between these two peoples caused by differences in culture and mode of life. The Iroquoian tribes were settled and agricultural, and corn was their staple food; the Rice Lake people were probably nomadic hunters who lived more upon meat and fish.

Among the Iroquoian peoples— so far as the data collected go— it is only in the cephalic index that noteworthy differences occur.

Data are lacking that would show if there were any differences in stature among the Iroquoian tribes. The Roebuck and Middleport people were alike in average height, but the series of long bones from other Ontario Iroquois are too few to base conclusions upon, and there are no data as regards the Iroquois of New York state.

In stature it seems likely that the Roebuck and Middleport Iroquois were similar to the Tonawanda Iroquois of the present day; that is—according to statistics for the latter people—an average height in the men of 168·8 cm. (5 feet 6½ inches), in the women of 155·9 cm. (5 feet 1½ inches). It is an interesting question as to the effect upon Iroquoian stature of the intermixture with the whites. After 1651, with the destruction of the Huron, Tobacco, and Neutral nations by the Iroquois of New York state, general intermixture of the Iroquoian peoples took place, consequent upon the adoption by the conquerors of large numbers of captives of the defeated nations. Therefore, stature after that time among the Iroquois must have become uniform, supposing that there were in pre-European times differences among them in this respect. This is as far only as the Indian element was concerned; for at that time, too, intermixture with the whites had begun also, and the Iroquois were in process of becoming a very composite people.

At the present day the Tonawanda Iroquois are probably the purest blooded of the modern Iroquois. Statistics show them to be, in the characteristic measurements of the nose and face, of purer blood than are the Six Nations Iroquois. It is then probable that in stature also they would correspond to the pre-European Iroquois. It is significant, too, that the evidence points to a similarity between the stature of the Tonawanda Iroquois and that of the pre-European Iroquois of the Roebuck and Middleport villages. As, therefore, in stature the Tonawanda Iroquois are slightly shorter[1] than the Six Nations Iroquois, it seems likely that intermixture with white blood—probably mainly British in later times—has rather raised the average of Iroquoian stature; at any rate in the case of the Iroquois of Six Nations reserve this seems likely to have occurred.

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[1] Six Nations Reserve: av. height, men 170·45 cm. (5 ft. 7 ins.), women 157·08 cm. (5 ft. 1¾ ins.).

Non-Iroquoian long bones from the "Serpent" mound, Otonabee, show an average length similar to that of the Middleport and Roebuck long bones, and if there were only these alone, one would say that although there were differences in facial features and in culture, yet that stature was uniform among these Iroquoian and non-Iroquoian peoples. But there are a small number of long bones from the "Upper Miller" mound, Otonabee, belonging to some unusually tall men, the average stature of these few men being much greater than that of the Roebuck, Middleport, or "Serpent" mound men. Perhaps these bones are those of a few men of the Rice Lake tribes of exceptional stature. If included with the "Serpent" mound series they raise the average stature of the men of the Rice Lake tribes above that of the Iroquoian men.

In order to arrive at some conclusions as to the physical affinities of the Rice Lake tribes, comparative data are needed from the skeletal material of the prehistoric Algonkian tribes of Ontario. Until then they can only be labelled non-Iroquoian.

In the Neutral territory there are two classes of Iroquoian sites; those pre-European and characterized by an ossuary mode of burial, which are fairly certainly Neutral; and those post-European and characterized by a single grave form of burial, accompanied sometimes by ossuaries, which probably were inhabited by Iroquois of the Five Nations, possibly Senecas. The former are likely to be characterized by mesaticephalic crania; the second probably by a mixture of dolichocephalic and mesaticephalic crania on account of the inclusion of captives of the Neutral tribes. One would expect, however, that dolichocephalic crania on the whole would predominate in these sites. After 1653 it is probable that the head form of the Five Nations Iroquois began to grow broader in type, owing to the presence of mesaticephalic Neutrals, and the inclusion of other Indian tribes whose head form may have been broader than their own, but principally no doubt through intermixture with brachycephalic Europeans. At any rate, whereas in prehistoric times the Five Nations seem probably to have been distinctly dolichocephalic, at the present day they are, on the average, mesaticephalic in their type of head.

Among the confused mixture of cranial types in the Ontario Iroquois two arrest the attention on account of their strong contrast, and the fact that they occur in various sites. One type was that of a man with narrow head; narrow, low, in many cases receding, forehead, and large brow ridges; the face broad, but in proportion to the width of the head not so broad as in type No. 2; the face rather longer; the cheek bones large but not so outstanding as in the other. The narrow, sloping forehead, and the keen Indian eyes set deep under the heavy brows, added to the characteristic expression of the Indian face, might well in some cases have given to this man what Loskiel calls "a very fierce and dreadful countenance."

The second type was a man with a shorter, broader, head; broad, low, forehead; face broad and short with massive outstanding cheek bones—just such a type as one would consider characteristically Indian. There seem to be grounds for believing that the second was a type more common among the Neutral tribes, whereas the first was likely to have been a type rather to be found among the Five Nations, or possibly the Huron tribes.[1] The writer has qualified by "more common" and "rather to be found", as no doubt if these types are at basis Iroquoian they will probably occur among all the Iroquoian tribes; or, if not, at least by intermixture they may have spread and become established among the various peoples.

Before closing this paper it is necessary to admit the following limitations to the conclusions given. Some of them are based upon material unsatisfactory in point of numbers and there are many gaps in the data. It is very necessary to know something more about the physical anthropology of the prehistoric Five Nations Iroquois of New York state. It is very necessary, too, to know the physical characters of the Algonkian tribes who were northern neighbours to the Ontario Iroquois—as well as the tribes also of the west and south. Upon none of these questions has any information been obtained. It is hoped that with the collection of further data these gaps may become filled up and the conclusions arrived at in this research will be corrected and amplified by the work of other investigators.

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[1] But see the interesting observation by Peter Kalm that "The Hurons seem to have a longer, and Anies (Mohawks) a rounder, face".

APPENDIX I

DISTRIBUTION, MEANS, AND STANDARD DEVIATIONS OF THE MEASUREMENTS AND INDICES OF THE ROEBUCK CRANIA

TABLE I

Glabello-occipital Length

Mm.	Male	Female
166	…………	1
167	…………	…………
168	…………	…………
169	…………	…………
170	…………	1
171	…………	…………
172	…………	2
173	…………	…………
174	…………	…………
175	…………	2
176	…………	3
177	…………	…………
178	…………	2
179	…………	4
180	…………	2
181	…………	3
182	…………	…………
183	…………	2
184	1	…………
185	…………	…………
186	1	1
187	…………	…………
188	…………	…………
189	…………	…………
190	…………	…………
191	…………	1
192	…………	1
193	…………	…………
194	…………	…………
195	…………	…………
196	1	…………
No. of cases	3	25
Mean	188·67	178·64±0·75
Standard deviation	…………	5·53±0·53

TABLE II

Maximum Cranial Breadth

Mm.	Male	Female
133	…………	2
134	…………	2
135	…………	2
136	…………	2
137	…………	1
138	…………	4
139	…………	3
140	…………	1
141	…………	2
142	…………	2
143	…………	1
144	…………	1
145	…………	…………
146	1	…………
147	1	…………
148	1	2
No. of cases	3	25
Mean	147	138·84±0·55
Standard deviation	…………	4·05±0·39

TABLE III

Cephalic Index

—	Male	Female	Non-adult
73	……	1	…………
74	1	2	1
75	……	2	…………
76	……	2	2
77	……	4	1
78	……	4	2
79	……	2	1
80	2	1	…………
81	……	4	…………
82	……	2	1
83	……	…………	1
84	……	…………	…………
85	……	…………	…………
86	……	…………	…………
87	……	…………	1
No. of cases	3	24	10
Mean	78	77·88±0·36	79 ±0·79
Standard deviation	……	2·59±0·25	3·71±0·56

Table IV

Basi-bregmatic Height

Mm.	Male	Female
120	....	2
121	....	....
122	....	....
123	....	....
124	....	....
125	....	....
126	....	....
127	....	2
128	....	3
129	....	1
130	....	2
131	....	2
132	....	1
133	....	....
134	....	1
135	....	2
136	....	1
137	....	1
138	....	1
139	....	....
140	....	....
141	1	1
142	....	....
143	1	1
No. of cases	2	21
Mean	142	131·43±0·85
Standard deviation	....	5·77±0·6

Table V

Vertical Index

Mm.	Male	Female
66	....	1
67	....	1
68	....	....
69	....	1
70	....	1
71	....	1
72	1	3
73	....	3
74	....	3
75	....	1
76	....	....
77	1	2
78	....	2
79	....	2
80	....	....
81	....	....
82	....	....
No. of cases	2	21
Mean	74·5	73·48±0·53
Standard deviation	....	3·61±0·38

Table VI

Basi-nasal Length

Mm.	Male	Female
94	....	2
95	....	....
96	....	....
97	....	....
98	....	....
99	....	1
100	....	2
101	....	1
102	....	1
103	....	2
104	....	3
105	....	....
106	....	1
107	1	....
108	....	2
109	....	1
110	....	....
111	....	....
112	1	....
No. of cases	2	16
Mean	109·5	102·44±0·72
Standard deviation	....	4·29±0·51

Table VII

Basi-alveolar Length

Mm.	Male	Female
93	....	2
94	....	1
95	....	....
96	....	....
97	....	1
98	....	2
99	....	1
100	....	....
101	....	....
102	....	1
103	....	....
104	....	3
105	....	....
106	....	3
107	1	....
108	1	....
No. of cases	2	14
Mean	107·5	100·29±0·85
Standard deviation	....	4·71±0·6

TABLE VIII

Alveolar Index

Mm.	Male	Female
93	....	1
94	....	....
95	....	....
96	1	1
97	....	1
98	....	2
99	....	3
100	1	3
101	....	....
102	....	....
103	....	1
104	....	1
No. of cases	2	13
Mean	98	98·92±0·51
Standard deviation	....	2·7 ±0·36

TABLE IX

Minimum Frontal Diameter

Mm.	Male	Female
84	....	1
85	....	....
86	....	....
87	....	2
88	....	2
89	....	3
90	....	....
91	....	1
92	....	4
93	....	1
94	....	3
95	....	4
96	....	1
97	....	3
98	....	1
99	1	....
100	....	1
101	1	....
No. of cases	2	27
Mean	100	92·67±0·5
Standard deviation	....	3·86±0·35

TABLE X

Inter-fronto-malar Width

Mm.	Male	Female
87	....	1
88	....	....
89	....	1
90	....	....
91	....	....
92	....	....
93	....	....
94	....	1
95	....	1
96	....	2
97	....	3
98	....	6
99	....	1
100	1	4
101	....	1
102	....	1
103	....	2
104	....	1
105	....	....
106	1	1
No. of cases	2	26
Mean	103	98·23±0·54
Standard deviation	....	4·06±0·38

TABLE XI

Inter-fronto-malar Index[1]

Mm.	Male	Female
100	....	2
101	1	2
102	....	1
103	....	2
104	....	....
105	1	6
106	....	3
107	....	3
108	....	1
109	....	2
110	....	2
111	....	....
112	....	....
113	....	1
114	....	....
115	....	....
116	....	....
117	....	1
No. of cases	2	26
Mean	103	105·96±0·51
Standard deviation	....	3·87±0·36

---

[1] This index is based upon the proportion of the inter-fronto-malar width to the minimum frontal diameter. The greater the index the greater the width of this part of the face as compared with the width of the forehead.

TABLE XII

Fronto-interorbital Width

Mm.	Male	Female
20	...	...
20·5	...	2
21	...	...
21·5	...	...
22	...	...
22·5	...	2
23	...	1
23·5	...	...
24	...	4
24·5	...	...
25	2	3
25·5	...	1
26	...	2
26·5	...	2
27	...	2
27·5	...	1
28	...	1
No. of cases	2	21
Mean	25	24·76±0· 3
Standard deviation	...	2·07±0·22

TABLE XIII

Bizygomatic Breadth

Mm.	Male	Female
126	...	3
127	...	...
128	...	3
129	...	2
130	...	2
131	...	1
132	...	1
133	...	2
134	...	3
135	...	...
136	...	2
137	...	3
138	...	...
139	...	...
140	1	...
141	...	...
142	...	...
143	...	...
144	...	...
145	1	...
146	...	...
147	1	...
148	...	1
No. of cases	3	23
Mean	144	132·26±0·84
Standard deviation	...	4·91±0·49

TABLE XIV

Upper Facial Height *(Nasi-alveolar Length)*

Mm.	Male	Female
64	...	2
65	...	1
66	...	...
67	...	5
68	...	2
69	...	2
70	...	1
71	...	...
72	1	4
73	...	...
74	...	...
75	...	2
76	...	...
77	...	...
78	...	...
79	1	...
80	...	1
No. of cases	2	20
Mean	75·5	69·5 ±0·6
Standard deviation	...	3·96±0·42

TABLE XV

Upper Facial Index

Mm.	Male	Female
48	...	2
49	...	...
50	1	1
51	...	1
52	...	2
53	...	3
54	1	4
55	...	2
56	...	2
No. of cases	2	17
Mean	52	52·82±0·39
Standard deviation	...	2·36±0·27

TABLE XVI

Nasal Height (Nasion-akanthion)

Mm.	Male	Female
46	....	1
47	....	....
48	....	3
49	....	3
50	....	5
51	....	3
52	....	5
53	....	....
54	....	2
55	1	2
56	....	....
57	....	....
58	1	1
59	....	....
60	....	1
No. of cases	2	26
Mean	56·5	51·38±0·41
Standard deviation	....	3·1 ±0·29

TABLE XVII

Nasal Width

Mm.	Male	Female
22	....	1
22·5	....	....
23	....	1
23·5	....	....
24	....	....
24·5	....	....
25	....	3
25·5	....	1
26	....	4
26·5	....	2
27	1	2
27·5	1	1
28	....	3
28·5	....	1
29	....	2
29·5	1	1
30	....	1
30·5	....	....
31	....	1
No. of cases	3	24
Mean	28	26·88±0·29
Standard deviation	....	2·08±0·2

TABLE XVIII

Nasal Index

Mm.	Male	Female
44	....	1
45	....	....
46	....	2
47	1	1
48	....	1
49	1	....
50	....	3
51	....	1
52	....	3
53	....	3
54	....	2
55	....	1
56	....	3
57	....	1
58	....	....
59	....	1
60	....	....
61	....	1
No. of cases	2	24
Mean	48	52·29±0·57
Standard deviation	....	4·14±0·4

TABLE XIX

Nasal Height (Nasion-subnasal Point)

Mm.	Male	Female
48	....	1
48·5	....	3
49	....	3
49·5	....	1
50	....	1
50·5	....	1
51	....	1
51·5	....	....
52	....	1
52·5	....	....
53	....	2
53·5	....	....
54	....	2
54·5	....	2
55	....	....
55·5	....	....
56	....	1
56·5	....	....
57	....	1
57·5	1	....
58	....	....
58·5	....	....
59	....	....
59·5	....	....
60	....	1
No. of cases	1	21
Mean	57·5	51·88±0·48
Standard deviation	....	3·24±0·34

TABLE XX

Nasal Index (2)[1]

Mm.	Male	Female
43	...	1
44	...	...
45	...	...
46	...	1
47	...	2
48	1	2
49	...	...
50	...	...
51	...	4
52	...	1
53	...	3
54	...	2
55	...	2
56	...	1
57	...	...
58	...	1
59	...	1
60	...	...
61	...	...
No. of cases	1	21
Mean	48	51·67±0·58
Standard deviation	...	3·97±0·41

TABLE XXI

Basion-subnasal Point

Mm.	Male	Female
84	...	1
85	...	1
86	...	1
87	...	1
88	...	1
89	...	...
90	...	...
91	...	3
92	...	...
93	...	3
94	...	3
95	1	...
96	...	...
97	...	...
98	...	...
99	...	...
100	...	...
101	...	1
No. of cases	1	15
Mean	95	91±0·74
Standard deviation	...	4·27±0·53

TABLE XXII

Orbital Height[2]

Mm.	Male	Female
30·5	...	(1)
31	...	(1)
31·5	...	...
32	...	(1)
32·5	...	3
33	...	3
33·5	...	1 (1)
34	...	2
34·5	...	1
35	...	2
35·5	...	2 (2)
36	1	1
36·5	...	...
37	...	...
37·5	1	...
No. of cases	2	15 (6)
Mean	36·75	Left orbits 33·97, right 33; mean of both 33·69±0·22
Standard deviation (both left and right orbits)		1·52±0·16

TABLE XXIII

Orbital Width[2]

Mm.	Male	Female
35·5	...	(1)
36	...	(1)
36·5	...	1
37	...	1
37·5	...	1
38	...	(3)
38·5	...	...
39	...	4
39·5	...	2
40	1	3 (1)
40·5	...	(1)
41	...	2
41·5	...	...
42	...	1
42·5	...	...
43	...	...
43·5	...	...
44	1	...
No. of cases	2	15 (7)
Mean	42	Left orbits 39·33, right 38; mean of both 39·81±0·24
Standard deviation (both left and right orbits)		1·66±0·17

---

[1] Nasal height measured from nasion to subnasal point.

[2] Numbers in brackets are the measurements of the right orbits in those crania in which the left orbit was too defective to measure.

TABLE XXIV

Orbital Index[1]

Mm.	Male	Female
79		1 (1)
80		(1)
81		1
82		
83		2
84		1
85	1	1
86		(1)
87		2
88		2 (1)
89		2
90	1	
91		3
92		
93		(1)
94		
95		
96		
97		
98		
99		
100		(1)
No. of cases	2	15 (6)
Mean	87·5	Left orbits 86·4, right 87·67; mean of both 86·76±0·73

Standard deviation (both left and right orbits) 4·98±0·52

TABLE XXV

Palato-maxillary Length

Mm.	Male	Female
50		1
51		1
52		1
53		1
54		
55	1	1
56		1
No. of cases	1	6
Mean	55	52·83

TABLE XXVI

Palato-maxillary Breadth

Mm.	Male	Female
60		1
61		
62		1
63	1	
64		1
65		1
66		
67		
58		
69		1
70		1
No. of cases	1	6
Mean	63	65

TABLE XXVII

Palato-maxillary Index

Mm.	Male	Female
111		1
112		
113		
114		
115	1	
116		
117		
118		
119		
120		1
121		
122		
123		1
124		
125		1
126		
127		1
128		
129		
130		
131		
132		
133		1
No. of cases	1	6
Mean	115	123·17

---

[1] Numbers in brackets are the measurements of the right orbits in those crania in which the left orbit was too defective to measure.

TABLE XXVIII

Width of the Nasal Bones at Their Junction with the Frontal

Mm.	Male	Female
3·5		1
4		
4·5		
5		
5·5		
6		
6·5		
7		
7·5		
8		
8·5		
9		3
9·5		
10		
10·5		1
11		4
11·5		1
12		1
12·5		3
13		3
13·5		
14		
14·5		
15		4
15·5		
16		
16·5		
17		
17·5		
18		
18·5	1	
No. of cases	1	21
Mean	18·5	11·67±0·38
Standard deviation		2·61±0·27

TABLE XXIX

Characters of the Crania[1]

Forehead

Male				Female			
High	Medium	Low	Low and receding	High	Medium	Low	Low and receding
2	1			1	6	13	12

Frontal Ridges

Male					Female				
Very marked	Marked	Medium	Slightly marked	Not marked	Very marked	Marked	Medium	Slightly marked	Not marked
	1	1	1		4	9	4	18	2

Mastoids

Male			Female		
Large	Medium	Small	Large	Medium	Small
3			17	13	5

Temporal Muscles

Male			Female		
Well marked	Medium	Poorly marked	Well marked	Medium	Poorly marked
2	1		14	12	5

Occiput

Male			Female		
Prominent	Medium	Not prominent	Prominent	Medium	Not prominent
1	1	1	16	6	4

---

[1] Three male and 37 female crania are described here, but as some are defective or fragmentary the numbers vary under the different headings according to the number of crania upon which the character could be noted.

TABLE XXIX—*Concluded*

Male				Female			
Scaphoid Crania							
Present	Absent			Present	Absent		
	2				32		
Glenoid Fossa							
Shallow (normal)	Shallow (pathological)	Medium depth	Deep	Shallow (normal)	Shallow (pathological)	Medium depth	Deep
			3	2	7	10	16
Malar Bones							
Very large	Large	Medium	Small	Very large	Large	Medium	Small
	2	1		1	18	6	3
Malar Bones							
Strongly everted	Everted	Medium	Not prominent	Strongly everted	Everted	Medium	Not prominent
1	1	1			12	7	9
Nasal Bones							
Broad	Medium	Narrow		Broad	Medium	Narrow	
3				11	4	6	
Nasal Bridge							
Broad	Medium	Narrow		Broad	Medium	Narrow	
	2			11	2	1	
Level of Nasal Bones at Root of Nose							
Unusually high	Fairly high	Medium	Flat	Unusually high	Fairly high	Medium	Flat
	2			1	6	9	12
Nasal Spine							
Very prominent	Prominent	Medium	Small	Very prominent	Prominent	Medium	Small
	3			3	8	2	2
Lower Margins of Nasal Aperture							
Rounded	Medium	Very slightly rounded	Sharp	Rounded	Medium	Very slightly rounded	Sharp
2		1		14	5	1	7
Prenasal Fossæ							
Well marked	Slightly marked			Well marked	Slightly marked		
	1				2		
Chin							
Square	Round	Pointed		Square	Round	Pointed	
2	1			4	14	17	

APPENDIX II

MEASUREMENTS AND CHARACTERISTICS OF THE LONG BONES OF THE ROEBUCK IROQUOIS

Table XXX

Length of the Long Bones

Humerus

—	Male		Female	
	Right Mm.	Left Mm.	Right Mm.	Left Mm.
Max.......	350	345	348	343
Mean......	338	332·5	305·75	302·38
Min........	326	320	278	273
No........	2	2	24	21

Femur

—	Male				Female			
	Right		Left		Right		Left	
	Max. length Mm.	Oblique length Mm.	Max. length Mm.	Oblique length Mm.	Max. length Mm.	Oblique length Mm.	Max. length Mm.	Oblique length Mm.
Max.......	477	472	476	471	476	461	486	463
Mean......	464·7	461	462	458·7	428·81	423·06	431·24	422·67
Min........	450	447	449	447	390	394	402	395
No........	3	3	3	3	26	17	25	18

Tibia

—	Male				Female			
	Right		Left		Right		Left	
	Spine included Mm.	Spine excluded Mm.	Spine included Mm.	Spine excluded Mm.	Spine included Mm.	Spine excluded Mm.	Spine included Mm.	Spine excluded Mm.
Max.......	414	406	415	408	405	378	410	404
Mean......	397·3	392·3	402	395·5	360·88	355·22	362·82	357·92
Min........	386	382	389	383	332	330	335	328
No........	3	3	2	2	17	9	17	13

TABLE XXXI

Diameter of Humeral Heads

—	Total number of humeri				Paired humeri			
	Male		Female		Male		Female	
Mm.	Right	Left	Right	Left	Right	Left	Right	Left
37	....	....	1	....	....	....	....	....
37·5	....	....	....	1	....	....	....	....
38	....	....	....	....	....	....	....	....
38·5	....	....	....	1	....	....	....	1
39	....	....	3	2	....	....	2	2
39·5	....	....	3	3	....	....	3	3
40	....	....	4	1	....	....	1	....
40·5	....	....	1	....	....	....	....	....
41	....	....	2	6	....	....	1	2
41·5	....	....	1	....	....	....	1	....
42	....	....	2	3	....	....	....	2
42·5	....	....	5	1	....	....	5	1
43	....	....	2	3	....	....	1	2
43·5	....	....	....	2	....	....	....	1
44	....	....	....	....	....	....	....	....
44·5	....	....	1	2	....	....	....	1
45	....	....	1	....	....	....	1	....
45·5	....	1	....	....	....	1	....	....
46	....	....	....	....	....	....	....	....
46·5	....	....	....	....	....	....	....	....
47	1	....	....	....	1	....	....	....
47·5	....	....	....	....	....	....	....	....
48	....	....	....	....	....	....	....	....
48·5	....	1	....	....	....	1	....	....
49	1	....	....	....	1	....	....	....
No.	2	2	26	25	2	2	15	15
Mean	48	47	41·1	41·28	48	47	41·3	41·17

TABLE XXXII

Diameter of Femoral Heads

—	Total number of femora				Paired femora			
	Male		Female		Male		Female	
Mm.	Right	Left	Right	Left	Right	Left	Right	Left
38			1					
38·5				1				
39			1	1			1	1
39·5								
40				1				1
40·5			1				1	
41			2	1			2	1
41·5				1				
42			1	2			1	2
42·5			2	1			1	
43			2	2			1	1
43·5			2	2			1	2
44			4	3			4	2
44·5			2	2			1	2
45			3	3			2	3
45·5			1	1				1
46			1				1	
46·5	1	1	1	2	1	1	1	2
47	1	1			1	1		
47·5			1					
48			1	1			1	1
48·5			1				1	
49								
49·5	1				1			
50		1				1		
No.	3	3	27	24	3	3	19	19
Mean	47·67	47·83	43·76	43·42	47·67	47·83	43·79	43·82

TABLE XXXIII

Diameter of Tibial Heads

—	Total number of tibiæ				Paired tibiæ			
	Male		Female		Male		Female	
Mm.	Right	Left	Right	Left	Right	Left	Right	Left
58	...	...	1	...	...	...	...	...
58·5	...	...	...	...	...	...	...	...
59	...	...	...	...	...	...	...	...
59·5	...	...	...	...	...	...	...	...
60	...	...	...	...	...	...	...	...
60·5	...	...	...	...	...	...	...	...
61	...	...	...	...	...	...	...	...
61·5	...	...	...	...	...	...	...	...
62	...	...	...	...	...	...	...	...
62·5	...	...	...	...	...	...	...	...
63	...	...	...	...	...	...	...	...
63·5	...	...	...	...	...	...	...	...
64	...	...	...	2	...	...	...	1
64·5	...	...	1	...	...	...	1	...
65	...	...	...	...	...	...	...	...
65·5	...	...	...	...	...	...	...	...
66	...	...	1	1	...	...	...	...
66·5	...	...	...	...	...	...	...	...
67	...	...	...	3	...	...	...	1
67·5	...	...	1	...	...	...	1	...
68	...	...	...	...	...	...	...	...
68·5	...	...	...	...	...	...	...	...
69	...	...	2	2	...	...	...	...
69·5	...	...	...	...	...	...	...	...
70	...	...	...	...	...	...	...	...
70·5	...	...	...	...	...	...	...	...
71	...	...	...	...	...	...	...	...
71·5	...	...	1	2	...	...	1	1
72	...	...	2	1	...	...	...	...
72·5	...	...	...	...	...	...	...	...
73	...	...	...	1	...	...	...	...
73·5	...	...	...	...	...	...	...	...
74	...	...	...	...	...	...	...	...
74·5	...	...	...	...	...	...	...	...
75	...	...	1	...	...	...	...	...
75·5	...	...	...	...	...	...	...	...
76	...	...	...	...	...	...	...	...
76·5	...	...	...	...	...	...	...	...
77	...	...	...	...	...	...	...	...
77·5	...	...	...	...	...	...	...	...
78	...	...	...	...	...	...	...	...
78·5	...	...	...	...	...	...	...	...
79	1	...	...	1	...	...	...	...
79·5	...	...	...	...	...	...	...	...
80	1	...	...	...	...	...	...	...
No.	2	...	10	13	...	...	3	3
Mean	79·5	...	68·45	69·23	...	...	67·83	67·5

TABLE XXXIV

Platycnemic Index

Mm.	Male		Female	
	Index on right tibiæ	Index on left tibiæ	Index on right tibiæ	Index on left tibiæ
50				1
51				1
52	1			
53			1	
54		1		
55				
56			1	
57		1		2
58		1		1
59			1	3
60			4	2
61			2	2
62			4	4
63			1	
64			1	1
65			1	2
66			1	
67			3	
68				
69			2	1
70			1	1
71				3
72			2	
No.	1	3	25	24
Mean	52	56·33	63·56	61·92
Mean (right and left tibiæ combined)	55·25 (4)		62·76 (49)	

TABLE XXXV

Difference Between the Maximum and Oblique Lengths of the Femur

Mm.	Male		Female	
	Right femur	Left femur	Right femur	Left femur
2		1		1
3	2	1		
4			6	4
5	1	1	6	2
6			3	3
7			1	3
8			1	3
9				1
10				1
No.	3	3	17	18
Mean[1]	3·67	3·33	5·12	6·11

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[1] In 28 paired female femora the average difference between the maximum length and oblique length of the right femora is 5·1 mm.; of the left femora 5·7 mm.

Table XXXVI

Difference in Length Between Right and Left Paired Long Bones

Humerus:

In 4 paired male humeri, the right exceed the left in length by an average of 5·5 mm. a bone.

In 30 out of 32 paired female humeri, the right exceed the left in length by an average of 5·8 mm. a bone; in the remaining pair the left exceeds the right by 10 mm.

The excess in length of the right humerus (except in this one pair), varies from 2 to 13 mm.

Femur:

In 6 paired male femora, the right exceed the left in maximum length by an average of 2·7 mm. a bone, in oblique length by an average of 2·3 mm. a bone.

In 38 paired female femora, the left exceed the right in maximum length by an average of 3·27 mm. a bone; and in 28 paired female femora, the left exceed the right in oblique length by an average of 2·43 mm. a bone.

Tibia:

In 4 paired male tibiæ, the right exceed the left in length by an average of 1 mm. a bone, including the spine; by 2 mm. a bone, excluding the spine.

In 22 paired female tibiæ, the right exceed the left in length by an average of 0·09 mm. a bone, including the spine; and in 12 paired female tibiæ, the right exceed the left in length by an average of 1·83 a bone, excluding the spine.

Table XXXVII

Perforation of the Olecranon Fossa in the Humerus

—	Male	Female	Non-adult
Both humeri perforated	1	7	2
One perforate, the other imperforate	....	6	1
Both imperforate	1	17	14

Table XXXVIII

Occurrence of the "Squatting Facet" in the Tibiæ

—	Adult male Pairs	Adult female Pairs
Plainly marked facet	2	18
Very slightly marked facet	2	4
No facet	....	2

(There are two additional pairs of adult female tibiæ. In one pair the left tibia has no facet and the right tibia is defective. In the other pair the left tibia has a very slightly marked facet, the right none.)

APPENDIX III

CHART OF PATHOLOGICAL AND OTHER OBSERVATIONS ON THE ROEBUCK SKELETAL REMAINS

Pathological, and Other, Observations on the Skeletal Remains of the Roebuck Iroquois

Cat. No.	Age	Condition of joints	Condition of shafts of long bones	Condition of jaws and teeth	Other observations
			(*a*) *Adult Men*		
XIII. F. 183	Over middle age.	Vertebræ arthritic; glenoid fossa arthritic; sterno-clavicular joint arthritic.	Node on the lower half of the shaft of the right tibia.	Gums in bad shape; at least 5 abscesses present in upper jaw; 6 teeth affected by caries out of 18 left in both jaws.	
XIII. F. 17	Over middle age.	Vertebræ arthritic; sterno-clavicular joint arthritic; mandibular condyles and glenoid fossa arthritic.		Back teeth lost during life; upper maxillary at place where right molars had been has been absorbed, and there is a large opening into the antrum of Highmore; 7 teeth affected by caries out of 18 teeth left in both jaws.	Cranial sutures partly obliterated externally.
XIII. F. 251	Fairly young.	Greater part of skeleton missing, seems to have disintegrated.		Teeth generally good; 1 abscess in upper jaw; some of the molars in the lower jaw lost during life; 3 teeth affected by caries out of 26 teeth left in both jaws.	Large bony growth on inner surface of occipital bone; small inflammatory patch on the outer surface of the bone at this place.
XIII. F. 259		Of this skeleton only the lower limbs are left.			
			(*b*) *Elderly and Aged Women*		
XIII. F. 11		Vertebræ arthritic; condyle of mandible slightly arthritic, but no trace of arthritis in glenoid fossa; arthritic facet on the occipital bone at the basion as in XIII. F. 21; sacro-iliac joint arthritic.		Several abscesses and much inflammation in upper jaw; 4 teeth affected by caries out of 7 teeth left in both jaws; gums in very bad state.	Cranial sutures obliterated externally.
XIII. F. 14		All joints very arthritic; vertebræ very arthritic; condyles of mandible and glenoid fossæ arthritic; joints of right arm in very bad state.		2 abscesses in upper jaw, several abscesses also in lower jaw; 5 teeth affected by caries out of 13 teeth left in both jaws.	Cranial sutures partly obliterated externally.

XIII. F. 21	Vertebræ arthritic; sacro-iliac joint arthritic; osteophyte on the odontoid process and arthritic facet on the occipital bone at the basion to correspond.		At least one abscess present in upper jaw, one or more abscesses in lower jaw; 11 teeth left, all sound; part of palate only present.	
XIII. F. 22	Vertebræ arthritic; 2 lumbar vertebræ anchylosed; knee joints arthritic; glenoid fossæ slightly arthritic; sacro-iliac joint arthritic.		Lower jaw edentulous, upper partly so; only front part of palate present; some inflammation and probably abscesses in upper jaw; 1 upper tooth, the only tooth present, affected by caries.	
XIII. F. 31	Skeleton fragmentary; no pathological conditions visible.		Inflammation and abscesses in both jaws; gums in very bad state; 2 teeth affected by caries out of 8 teeth left in both jaws.	
XIII. F. 184	Vertebræ very arthritic		Only very small part of palate present; 1 abscess in upper jaw; 2 teeth affected by caries out of 6 teeth left in both jaws.	
XIII. F. 187	Vertebræ very arthritic; articular heads of femur and tibia arthritic; sacro-iliac joint arthritic.	Left humerus has been fractured during life and has knit again, but not evenly.	At least 1 abscess in upper jaw; palate fragmentary; 5 teeth affected by caries out of 12 teeth left in both jaws.	Result of wounds or abscesses on the left malar, lower edge of same partly absorbed; 3 shallow depressions on surface of bone.
XIII. F. 192	Right glenoid fossa slightly arthritic; skeleton fragmentary.		1 abscess in upper jaw, 2 in lower jaw; 3 teeth affected by caries out of 16 teeth left in both jaws; half palate only present.	Large inca bone present in skull.
XIII. F. 194	Skeleton fragmentary		Small part of palate missing; 1 abscess in lower jaw; 4 teeth affected by caries out of 23 teeth left in both jaws.	
XIII. F. 196	Skeleton very fragmentary; mandibular condyle and glenoid fossæ arthritic.		Part only of palate present; 4 teeth affected by caries out of 6 left in both jaws.	
XIII. F. 198	Vertebræ very arthritic; two lumbar vertebræ anchylosed; a rib anchylosed to vertebræ; sacro-iliac joint arthritic.		4 or more abscesses in upper jaw; gums in bad state; 5 teeth affected by caries out of 18 teeth left in both jaws.	
XIII. F. 238	Vertebræ slightly arthritic; end phalanges of big toes osteophytic; both metatarsals fused to the internal cuneiform bones.		Lower jaw edentulous, upper jaw almost so; 1 abscess present in upper jaw; 3 stumps of teeth affected by caries left in upper jaw.	
XIII. F. 262	Skeleton very fragmentary; vertebræ probably arthritic; glenoid fossa arthritic.		9 teeth affected by caries (this number represents all the teeth still left in both jaws).	

Cat. No.	Condition of joints	Condition of shafts of long bones	Condition of jaws and teeth	Other observations
(c) Women of Middle Age				
XIII. F. 2	Vertebræ arthritic; right patella arthritic; right glenoid fossa arthritic; scapulo-clavicular joint arthritic.		No palate present; lower jaw partly edentulous; inflammation and probably abscesses at the roots of three teeth affected by caries; 3 teeth affected by caries out of 6 teeth left in the lower jaw.	Temporal ridges very high and extensive. They approach to within 23 mm. of each other behind the bregma.
XIII. F. 24	Healthy		Gums in bad state; 9 teeth affected by caries out of 17 teeth left in both jaws.	
XIII. F. 15	Vertebræ arthritic; right knee joint arthritic; right glenoid fossa slightly arthritic.	Node on middle of shaft of left tibia.	Gums in bad state; 3 or more abscesses in upper jaw; lower jaw partly edentulous, only front teeth left; 10 teeth affected by caries out of 16 teeth left in both jaws.	
XIII. F. 30	Healthy		Palate fragmentary; 5 teeth affected by caries out of 19 teeth left in both jaws.	
XIII. F. 239	Vertebrae slightly arthritic; patella arthritic.		Some abscesses and inflammation in upper jaw, some inflammation in lower jaw; 7 teeth affected by caries out of 17 teeth left in both jaws; supernumerary bicuspid in process of eruption in right side of mandible on its lingual border.	
XIII. F. 240	Healthy		Abscesses and inflammation in upper jaw; molars of lower jaw lost during life; 14 teeth affected by caries out of 18 left in both jaws.	
XIII. F. 241	All joints arthritic, especially the knee joints.	The head of the left femur has apparently been fractured during life, but has knit again firmly. The fracture seems to have been caused by a backward wrench as in XIII. F. 250.	Abscesses and inflammation in upper jaw; back teeth in lower jaw lost during life; 6 teeth affected by caries out of 11 teeth left in both jaws.	
XIII. F. 243	Healthy apparently, but the skeleton is rather fragmentary.		Half palate only; some inflammation and abscesses in upper jaw, and inflammation in lower jaw also; back teeth in lower jaw lost during life; much overgrowth of cementum in teeth of upper jaw; 5 teeth affected by caries out of 14 teeth left in both jaws.	

XIII. F. 249	Healthy		Teeth in very bad state; several abscesses in upper jaw, 1 abscess in lower jaw; molars in lower jaw lost during life; 12 teeth affected by caries out of 23 left in both jaws.	
XIII. F. 250	Vertebræ slightly arthritic	Head of left femur has apparently been fractured during life and re-knit, in the same manner as XIII. F. 241.	Gums in bad state; abscesses and inflammation in upper jaw; back teeth in lower jaw lost during life; overgrowth of cementum in back teeth of upper jaw; 9 teeth affected by caries out of 17 teeth left in both jaws.	
XIII. F. 255	Healthy apparently, but the skeleton is very fragmentary.		Inflammation at the roots of the teeth affected by caries in lower jaw; 5 teeth affected by caries out of 28 teeth left in both jaws.	

(*d*) *Women under Middle Age*

XIII. F. 190	Some of the vertebræ slightly arthritic; glenoid fossa slightly arthritic; sacro-iliac joint arthritic.		Gums in bad state; several abscesses in upper jaw, teeth in process of dropping out; lower jaw nearly edentulous; inflammation and probably abscess at root of canine in lower jaw; 3 teeth affected by caries out of 12 teeth left in both jaws.	
XIII. F. 188	Condyles of mandible, glenoid fossæ, sacro-iliac joint, right patella, right and left astragali, head of right tibia, and lower articular end of right femur all arthritic.		Gums in bad state, many teeth lost; much inflammation and abscesses in upper jaw, lower jaw practically edentulous; 1 tooth affected by caries out of 6 teeth left in upper jaw.	
XIII. F. 13	Healthy		1 abscess in upper jaw opening into antrum of Highmore, inflammation at roots of left first molar in upper jaw; only one wisdom tooth erupted in both jaws; first right molar in lower jaw lost during life; 4 teeth affected by caries out of 25 teeth left in both jaws.	
XIII. F. 28	Healthy		1 abscess in upper jaw; in lower jaw left molars lost during life, some inflammation at their roots; 8 teeth affected by caries out of 28 teeth left in both jaws.	
XIII. F. 256	Glenoid fossa arthritic; skeleton very fragmentary.		Several abscesses and inflammation in both upper and lower jaws; 6 teeth affected by caries out of 29 left in both jaws.	

Cat. No.	Condition of joints	Condition of shafts of long bones	Condition of jaws and teeth	Other observations
(d) Women under Middle Age—Concluded				
XIII. F. 261	Healthy		Fine set of 16 big teeth in upper jaw, all sound; some inflammation and abscesses in lower jaw; 3 teeth affected by caries out of 16 teeth in lower jaw.	
XIII. F. 252	Vertebræ arthritic; two vertebræ, probably last dorsal, anchylosed.		Gums in very bad state; much inflammation and many abscesses in upper jaw; back teeth in lower jaw lost during life; 14 teeth affected by caries out of 21 teeth left in both jaws.	
XIII. F. 27	Healthy	Very slight swelling or thickening on the middle of the shaft of the right tibia on the posterior aspect.	2 abscesses in upper jaw; in lower jaw, first two molars on both sides lost during life; 4 teeth affected by caries out of 26 teeth left in both jaws.	
(e) Young Women				
XIII. F. 8	Healthy		Third molars in upper jaw have apparently never erupted; 23 sound teeth in both jaws; jaws healthy and no caries; molars in lower jaw lost during life.	
XIII. F. 191	Healthy	At the insertion of the teres major muscle in both humeri there are fossæ in the bone.	1 abscess in upper jaw; 3 teeth affected by caries out of 28 left in both jaws; 1 supernumerary left bicuspid, a mere peg, in lower jaw.	
XIII. F. 199	Vertebræ slightly arthritic; occipital condyles arthritic; glenoid fossa and mandibular condyles slightly arthritic.		1 abscess in upper jaw opening into antrum of Highmore; 5 teeth affected by caries out of 27 left in both jaws.	Incomplete closure of first sternal lamina.
XIII. F. 26	Sacro-iliac joint arthritic; pelvis probably deformed as the left wing of the sacrum is lower than the right and unlike the right in appearance.		2 abscesses in upper jaw; 3 teeth affected by caries out of 30 left in both jaws.	

XIII. F. 200	Healthy		3 teeth affected by caries out of 25 teeth left in both jaws; first two molars in lower jaw seem to have been lost during life (apparently some inflammation at the roots of these two teeth).	2 small basilar processes on occipital bone.
XIII. F. 9	One lumbar vertebra osteophytic (the lamina with the spinous process of this vertebra appear to have been separate during life from the centrum).		Gums in bad state; left molars in upper jaw lost during life; 5 abscesses and much inflammation in upper jaw; 2 abscesses and some inflammation in lower jaw; nearly all molars in lower jaw lost during life; 15 teeth affected by caries out of 22 teeth left in both jaws.	
XIII. F. 248	Right glenoid fossa and right mandibular condyle arthritic; 2 dorsal vertebræ anchylosed; centra of the other dorsal vertebræ seem to be irregularly shaped.		Inflammation in upper jaw at roots of lost wisdom teeth; in lower jaw all molars but one, and also one bicuspid, lost during life; 3 teeth affected by caries out of the 24 teeth left in both jaws.	Metopic suture present in the cranium. Pelvic rim has not long ossified yet the teeth are well worn and most of the back teeth in the lower jaw have been lost during life.